THE TEACHER AS INTERFACE

TEACHERS OF EFL IN ICT-RICH ENVIRONMENTS: BELIEFS, PRACTICES, APPROPRIATION

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Preface

After 20 years as a teacher – making use of digital technologies for 15 of these – I gradually and increasingly came to wonder how these technologies *really* affect the processes of teaching and learning. In particular, I became preoccupied with the apparent contradiction between the potential of digital technologies, the political rhetoric surrounding them, and the attempts at making them work in the classroom. When the Department of Teacher Education and School Development provided me with the opportunity to carry out a doctoral study into exactly these issues, I felt like I was 'coming home'.

A fundamental and recurring assumption in this study is how we extend our knowledge through social interaction and constant interplay with our environment. To mediate such processes, humans have developed artifacts that help us attune to historically developed insights and that help us create new ones. As my work on this thesis progressed I increasingly became aware of such processes, and of how my thesis took shape during the innumerable exchanges – remarks, questions, concerns, advice etc – from colleagues, friends, family, wife and children. Moreover, these exchanges were mediated by cultural tools – languages, analog and digital technologies – that also left their imprint on the emerging text. The outcome – the final text, is, nevertheless, the product of my decisions and is, thus, my sole responsibility.

The numerous people who assisted me in the research processes are too many to name, but some have been so invaluable that they simply must be mentioned. First and foremost, my supervisor, Professor Aud Marit Simensen from the Department of Teacher Education and School Development and side supervisor, Associate Professor Sten Ludvigsen from InterMedia, have guided, encouraged and constructively critiqued my work far beyond the call of duty – not to mention standard working hours! In addition, I have benefited greatly from the various scientific communities at the Faculty of Education, InterMedia and the Faculty of Arts. I would also like to thank my fellow doctoral students at the Department of Education and School Development who have constituted a stimulating forum conducive to educational research. I owe Glenn and Magne for many hours of critical reading and constructive commentary, and Leif Martin at NTNU for his highly relevant and inspiring views and comments. I would also like to thank my brother, Dr.polit Karl Erik Lund at SIRUS, for providing invaluable moral as well as professional support.

A research community that focuses on education is totally dependent on positive and forthcoming educators: teachers, learners and administrations. The three teachers and the many learners who willingly and enthusiastically opened their doors to let me observe their practices deserve very special thanks, indeed. Only considerations about anonymity keep me from thanking them by name for the courage, creativity and enthusiasm they showed. In addition I want to thank the editor of *The Tower*, Isobel Smith Simonsen, for her help and support.

Finally, I would like to express my gratitude to staff and faculty at the Department of Education, University of California, Irvine. A very special thanks to Mark Warschauer.

All of the above and many other voices resonate throughout the pages that follow.

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Andreas Lund

Contents

List of tables

List of figures

1. The Teacher As Interface

> **in·ter·face** (in't?r fas'), *n., v.,* **-faced, -facing**. - *n.* **1.** a surface regarded as the common boundary of two bodies or spaces. **2.** the facts, problems, considerations, theories, practices etc. shared by two or more disciplines, procedures, or fields of study; *the interface of chemistry and physics.* **3.** a common boundary or inter-connection between systems, equipment, concepts, or human beings. **4.** *Computer Technol.* **a.** equipment or programs designed to communicate information from one system of computing devices or programs to another . **b.** any arrangement for such communication. - *v.t.* **5.** to bring into an interface. - *v.i.* **6.** to be in an interface. **7.** to function as an interface. [INTER + FACE]
>
> *Webster's Encyclopedic Unabridged Dictionary of the English Language*
> *1994, New York: Random House*

1.1. Introduction

The present thesis is a study of teachers of English as a Foreign Language (EFL) and their encounters with Information and Communication Technologies (ICTs): how teachers perceive the impact of such technologies on education and on their specific subject domain, and how they practice in learning environments where ICTs are integrated. This is the phenomenon that is being researched.

Teachers' encounters with ICT and how they integrate ICTs in their work constitute a complex and multi-faceted phenomenon. In the present study, two main research approaches are chosen. Partly, the study aims to capture teachers' socially and culturally constructed beliefs about and attitudes to ICTs. How they look upon their vocational situation and practices is researched through a survey with pre-designed as well as open-ended questions. Partly, the study aims to capture aspects of teachers' practices in ICT-rich environments. How they practice is researched through ethnographic classroom observations.

The basic assumption is that education should prepare learners for life and work in the immediate and more distant future, not just serve a curriculum. *Technologies* as introduced, used, mediated, and brokered by *teachers* will play a crucial role in such an endeavor and therefore we need to develop insights as to how the interplay between teachers, learners, and technologies affect life in the classroom. Much research has already been done on the role of ICTs in education. Still, the present study argues that teachers' encounters with and integration of technologies, their *appropriation*[1] of them, is an under-researched phenomenon.

In the present study, teachers' appropriation processes are observed where three strands intersect: the school subject they teach, the technologies they seek to integrate, and the

[1] The construct of *appropriation* is discussed in some detail in Chapter 2.3.5. However, it is important from the start to emphasize appropriation as a multilevel construct and not one that signifies progression or phases of integration. Instead of seeing appropriation as a gradual process of mastering ICTs, it is a question of how we relate to and interact with concepts, tools, and knowledge.

didactics[2] they employ. The composite and mutually constitutive field of EFL, ICTs and (subject) didactics is not an established academic domain. However, as ICTs continue to make their impact on diverse school subjects it is assumed that the intersection of school subject, technologies and didactics will become an interesting area for further research. *It is where the three fields converge that this study intends to make a contribution and not primarily to the separate fields.* Hence, it is necessary to give a preliminary description of this particular realm before formulating the research questions driving the present study. Figure 1.1 (below) illustrates the intersection referred to and, thus, where the phenomenon is studied.

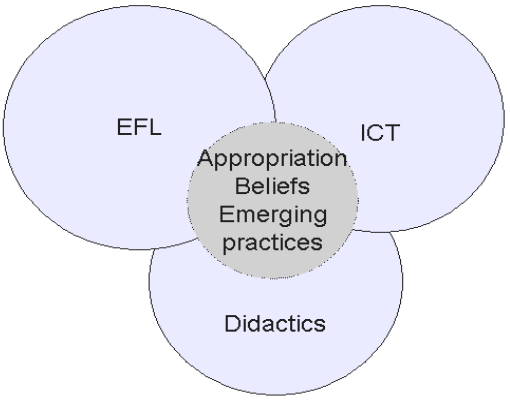

Fig 1.1 The intersection of school subject, technologies and didactics. Teachers' appropriation of technologies takes place at the interface of the three fields

Teachers' encounters with and integration of ICTs are an observable phenomenon that is intersubjective in the sense that its essence is located at the nexus of subject matter (EFL), technologies (ICTs), and 'the science of teaching' – didactics. However, in the present study the focus is more on teachers' *practices* than on the subject matter and technologies involved. Practices subsume the school subject and technologies, or rather; the latter two elements are interwoven in educational practices and not regarded as separate properties. We see the school subject in the activities in which it is embedded. This is one reason why a *sociocultural* perspective is used as a theoretical lens. A sociocultural approach sees a school subject as being constituted through practices and discourse. A basic premise is that knowledge emerges as people participate in social and cultural practices, not transferred from a source and then stored in the individual mind as a property. Practices consist of activities, and activities constitute the principal focus in the present thesis. Such activities involve teachers, learners, and technologies; how they interact with each other and how they influence and are influenced by their environments. Such activities, then, represent change – *transformation* – in humans as well as in contextual factors, and these transformations are found at individual, collective and institutional levels.

There is a complexity involved that makes it necessary to employ a perspective that sees human conduct, e.g. learning and teaching, as fundamentally *social*, as practices that cannot be separated from the historical and cultural contexts in which they take place. Consequently, learning and teaching are seen as aspects of *enculturation*. This is the second reason a sociocultural perspective is chosen.

[2] A preliminary note on the term *Didactics* is in place. It is here used in a non-prescriptive way, devoid of its etymological connotations of being 'deictic', and the often normative and prescriptive connotations within the English vernacular. The term is defined in Table 1.1 in Chapter 1.7. Didactics is discussed in more detail in Chapter 3.9.

But there is a future aspect as well. Learners should be prepared to handle challenges and improve social conditions in the years to come. This involves both enculturation and developing potential for *cultural change and renewal*. Technologies influence and change the way we view the world. Technologies accumulate and reproduce human insights while at the same time carrying a potential for further development of such insights. This view of technologies as cultural tools, *artifacts*, is central to a sociocultural perspective and therefore essential in the present study.

While technologies carry certain properties that may be conducive to changing educational practices, these practices are at the same time heavily influenced by the social and cultural heritage they are embedded in. Change and renewal depend on how tensions and possible contradictions between potentially innovative technologies and the contexts they enter into unfold. Consequently, the interplay between humans, tools and their sociocultural contexts emerges as an analytic focus. While a rich research literature on learning with and through ICTs has emerged in later years – particularly within the tradition of Computer Support for Collaborative Learning (CSCL) – focus has often been on technological design and/or learner interaction with technology. The role of the teacher raises unanswered questions. To pursue these, the present study argues that teachers, learners and technologies should be studied as they interact in learning activities and situations, not as separate elements or just binary combinations. Even if we may know too little about the nature of such interactions, we know that they are so complex that innovative practices conducive to learning and teaching have been slow in materializing. Exactly what this complexity consists of is not all that well documented in research literature, and is therefore a main concern for the present study.

The encounters between teachers and technology referred to in this study are located partly in a sample of teachers taking part in an in-service course, *The Tower*, combining new technologies with learner-centered approaches to teaching and learning[3], partly in the form of a close study of three practicing teachers. In both cases – *The Tower* and in the classrooms – teachers work in co-located, physical settings as well as in networked, online environments. Their beliefs, roles and practices formed at the interface of these two dimensions add up to the phenomenon the present study explores and analyzes. The rationale is to gain insights into the multiple patterns of activity that unfold in the ICT-rich classroom. Also, to understand such processes may be conducive to developing relevant and future oriented teacher education as well as in-service training[4]. Reorganization of working life (Gee, 2000; Gee, Hull, & Lankshear, 1996)[5] and a rapid development of ICTs require response from educators. Exactly what this response should be is, of course, a matter of discussion. The present thesis aims to contribute to an understanding of what the situation requires.

The present study takes a predominantly qualitative approach but with quantitative methods interspersed, adding up to a mixed method approach. The phenomenon is studied through the

[3] *The Tower* is treated in some detail in Chapter 5. Suffice to say that this course served EFL teachers who wanted to integrate ICTs in their practices. It required participants to familiarize themselves with technologies situated in EFL practices, do assignments, and take part in an online discussion forum. On this basis, the present study elicits these teachers' beliefs about ICTs. A survey in the form of a questionnaire and postings on the forum form the data used in descriptive statistics analysis.

[4] Teacher education is here understood broadly, i.e. as an integrated model where future teachers participate in disciplinary, pedagogic and didactic discourses simultaneously as well as a consecutive model where a study of a particular discipline is followed by a study of (subject) didactics and pedagogy. In-service training is understood as institutionally organized efforts to increase teacher professionalism among practicing teachers.

[5] The format used for citation in the present study is the American Psychological Association (APA) style. However, it is somewhat adjusted so that the first time more than three authors are named, they appear as first author's name *et al*.

lenses of a survey and classroom observation before implications for classroom practices, teacher education and in-service training are discussed. The thesis argues that *The Tower* survey and the classroom analyses have profound implications for how we come to regard learning and teaching with ICTs. The reason is found in the transformational potential in ICTs, how they (therefore) come to change classroom practices, and how teachers of EFL appropriate such technologies (cf Chapter 7 for a discussion of outcomes, contributions and implications of the study).

1.2. Research questions

Addressing the needs of a knowledge society, A. Edwards et al. (2002:115) pose four questions: "What kinds of learners are we likely to need? What kinds of pedagogical practices are likely to support their learning? What kinds of teachers do we think will be able to support their learning? Where are those teachers and how are they to be supported?" While all four questions are relevant, especially number two and three can be seen as framing the larger concerns of the present study.

The history of teachers working at the interface of co-located, physical learning environments and digital, networked, and distributed forms is a brief one. Only recently have studies begun to appear that show us what it is like to be a teacher in technology-rich environments. For teachers, the concern is how to make ICTs work for them and their learners so that expectations are met. They are expected to take a particular technology that is currently making a tremendous impact on the world of work as well as social and private lives and make it 'theirs'; i.e. essentially to take tools that were not originally developed for learning and teaching and transform them into vehicles for greater opportunities for learning. This process of adoption, adaptation and transformation is a process of *appropriation*, a key construct in the present study (cf Chapter 2.3.5 for a discussion). Consequently, the research questions in this study aim to capture aspects of such appropriation processes. This is done by partly exploring teachers' beliefs, partly by observing their practices as they materialize in ICT-intense environments. The research field may thus be broadly stated as *EFL Teachers' Encounters with Technology*. An accompanying, preliminary research question might then be formulated as:

- **What happens when teachers of English use ICTs in their practices?**

This is an extremely broad question. It addresses possible changes in the English language and in learning and teaching as a result of digital tools, and how teachers and learners behave under the impact of ICTs. Consequently, subsequent research questions are needed in order to sharpen the focus. Since the present study targets teachers, it is important to elicit some of their beliefs as well as explore some of their practices. This is sought by asking three supplementary questions:

1. **What are some of the beliefs and attitudes of teachers of English who encounter ICTs in their profession?**
2. **What kind of educational practices emerge when teachers of English integrate ICTs in their classes?**
3. **Under what conditions do we see innovative practices emerge?**

The first question is directly related to the sample of teachers who participated in *The Tower* – an in-service course for teachers of English. It is not intended as an instrument to disclose discrete mental properties of the participants but as a guide to the process in which teachers

articulate their perception of technology in their professional lives. It qualifies the subsequent research question, which seeks to guide our understanding of what goes on in the complex world of working in ICT-intense settings. The answers to question 1 aim to sensitize the research into classroom interactions addressed by question 2. While question 1 addresses individual concerns (that add up to concerns of a sample, cf Chapter 5), question 2 addresses an interactional level (cf Chapter 6). Where such practices may be seen as innovative it is important to look beyond the individual and interactional levels and to the institutional level represented by schools, policy papers and decision makers (limited to a Norwegian perspective but hopefully with relevance elsewhere). Question 3 addresses this level.

The research questions might seem to address teachers only. However, the aim is to see teachers' encounters in an interactive perspective where teachers, learners, technological artifacts, and environments constitute an *information ecology*[6], "a system of people, practices, values, and technologies in a particular environment. In information ecologies, the spotlight is not on technology, but on human activities that are served by technologies" (Nardi & O'Day, 1999:49). The above research questions address the actions of teachers, but teachers' actions cannot be analyzed in isolation. They are part of such an information ecology and this ecology is a historically, culturally and socially constructed world. This perspective calls for a unit of analysis that captures a complexity that goes beyond the individual's appropriation of technology, and captures processes in which the use of ICTs transforms the social practices of learning and teaching. Consequently, the broad preliminary research question and the three supporting questions can be formulated in the following:

- **In what ways are ICTs appropriated in the EFL classroom?**

This seemingly brief wording is intended to capture the complexities described above, but with a focus on the roles teachers play when organizing classroom activities conducive to learning and the epistemic environment they create. Why this question is important is discussed in the following.

1.3. Why teachers?

In their introduction to the May 2002 issue of the educational journal *Language Learning and Technology*, a special issue on ICTs and teacher education, the editors point to four concerns for technology and teacher education:

> *First, the cognitive and psychological process of technology integration by teachers awaits exploring. What kind of cognitive and psychological factors affect teacher adoption of technology? (…) Second, the kind of social and organizational arrangements that promote technology use by teachers is another area that needs further exploration. Some persistent issues include the following: Why do only a few teachers in a particular school use technology? (…) Third, the relationship between teachers and technology has been a long-standing issue that is yet to be resolved. (…) Last, as Internet-based education becomes increasingly popular, we also need to explore the differences and similarities in online versus face-to-face teaching (Zhao & Tella, 2002:3-4).*

Based on extensive reading in the field, the present researcher agrees with the editors when they summarize, "Relatively little is known about how teachers interact with technology.

[6] The construct *Information ecology* is used in several places throughout the present study. It should be noted that despite its technical overtones, it is regarded very much as a *social* ecology, what Jay Lemke (2000) refers to as an *Ecosocial system* that captures interactions between humans and non-humans, cf Chapter 4.4.2.

However it has become increasingly clear that teachers are key to the realization of its claimed potentials" (op.cit.:1). Another study identifies three domains that contribute to successful integration of technologies in the classroom, and states that "the teacher, in our study, appeared to play a more significant role than other domains" (Zhao, Pugh, Sheldon, & Byers, 2002:29), the other two being the nature of the project/innovation and the context/school. This finding is substantiated by an overview of case studies that conclude: "Inadequate training and support of teachers has consistently been identified as the single-most problematic issue in introducing technology into developed-country classrooms" (Capper, 2000:17).

While quite some research has been done on computers and learners, computers and learning and classroom interaction, less has been done on teachers practicing within *a specific subject domain* in technology-rich environments. Researchers find that "Most of the current efforts take a very narrow view of what teachers need to use technology – some technical skills and a good attitude" (Zhao et al., 2002:v). Still others find that political, institutional, and contextual constraints inhibit teachers' innovative uses (Cuban, 1986; Gobbo & Girardi, 2001). Some studies focus on teachers' beliefs about learning and how they correlate with their use of ICTs (Becker, 1994, 1999, 2000; Cloke & Sharif, 2001; Fulton, 1999). Finally, there is a growing body of research on the interplay of teachers, learners, technologies and their social and cultural embeddedness (Gobbo & Girardi, 2001; Zhao et al., 2002). Nevertheless, as argued by Zhao et al., "these types of studies tend to neglect the messy process through which teachers struggle to negotiate a foreign and potentially disruptive innovation into their familiar environment", and that, "there is a conspicuous lack of attention to the complexities and intricacies of how classroom teachers actually incorporate technology in their teaching" (Zhao et al., 2002). This may be one reason for studies that conclude that ICTs have been integrated by teachers only to little extent (Erstad & Frølich, 2002; Karsenti et al., 2002; Rizzo, 2003).

The above concerns point to the rationale for the present study, as elaborated in Chapter 1.6 (below).

Teachers are important in the sense that it is through their practices learners are apprenticed into exploiting technologies as part of the total learning environment. Historically, teachers have been gatekeepers to what enters their classrooms in the form of materials, teaching methods and tools; i.e. they have been instrumental in delivering the curriculum. The present study argues that this is an insufficient position. Instead, teachers as designers[7] of environments and situations conducive to learning along with their *expertise* (cf Chapter 6.10) in orchestrating such designs become essential. They need to design and orchestrate learning situations where learners engage in *relational agency*, i.e. " a capacity to use environmental resources (including relationships with others) to solve problems" (A. Edwards, 2002:5). Such relational agency involves a particular view of technologies; they are not just instrumental, changing our surroundings in a one-way direction. Rather, as we use technologies to achieve a goal, we become transformed in the process as well.

1.4. A knowledge domain and its framing

The analytic focus of the present study is directed at technologically mediated practices that evolve in the EFL classroom. Thus, didactics, ICTs (or more precisely, Computer Assisted Language Learning, CALL) and EFL are the components involved. It is the meeting ground of these three elements that constitutes the knowledge domain for this study. As such, it is essentially a variation of a basic triangle of humans, tools, and school subject. The

[7] The terms *design* and *designer* are elaborated in Chapters 3.11 and 4.4.4.

manifestations of elements may vary, e.g. technologies take on the form of analog or digital tools and emerge in contexts such as CALL or Computer Support for Collaborative Learning (CSCL). The present study takes this triangular model as a point of departure for analyzing practices that unfold. What is most important, however, is to see the elements as mutually constitutive of a cross-disciplinary domain. Moreover, they align themselves around an axis in the form of a particular perspective; they relate to a sociocultural view of humans, tools, and contexts as an inseparable unit. Such units can be studied on micro levels in classroom episodes as well as on macro levels when technologies are sought introduced on a national level.

This means that the sociocultural perspective becomes an integrative force in the present study. As ICTs become integrated in most school subjects and are not merely add-ons (or represent a distinct 'computer discipline'), the relevance of seeing how ICTs weave their way into a particular subject increases. But a generic approach to how learning and teaching are mediated by tools must be complemented with more subject specific studies to increase our understating of how the subject matter itself may change in the process. Admittedly, such a compound object of study may result in a 'crowded focus'. On the other hand, such a crowded focus is what teachers experience when they integrate ICTs in their school subject and their practices. This carries didactic consequences.

A school subject is a historical, cultural, and social construction. It is transformed by the values and importance assigned to it by policy makers and by the way it is configured by users. In the case of languages, for instance, "globalization changes the conditions in which language learning and teaching takes place" (Block & Cameron, 2002a:2). Today, the 'identity' of English is very different from the one previous generations of learners encountered. In fact, English offers several 'identities' to learners, its "disciplinary purity" (A. Edwards et al, 2002:6) is disrupted. Therefore, it is important to analyze its present nature and the goals it serves. In the present study, EFL is chosen for several reasons. English is one of the core subjects in the Norwegian curriculum, it is the first foreign language and the way it comes across in schooling will, consequently, affect all users. Moreover, English is especially interesting as the primary language on the Internet. In a networked and globalized world, English has become the principal communicative code across cultures. Most exchanges in English are between non-native speakers of the language (Block & Cameron, 2002a; Crystal, 1998; Graddol, 2001).

The above account describes a phenomenon that is dynamic and complex and that consists of humans (teachers and learners) interacting with – and through – technologies in order to raise their competence within a knowledge domain. The knowledge domain is not a particular subject area (school subject) but an *interface* where disciplines, skills, and practices are reconfigured. To make sense of such complexity and analyze some aspects crucial to teaching and learning in technology-rich environments, we need a theory that incorporates the above characteristics in its foundations. As was stated in the introduction (cf 1.1), the current project takes on a sociocultural perspective, both on teachers' perception of ICTs and their practices how these are molded in the tension between tradition on the one hand and innovation on the other and how they are influenced by the learning environment teachers are part of[8]:

The present study argues that taken together, changes in subject matter, in concepts of learning and teaching, and in learning environments present teachers with a potentially

[8] Without going into a discussion of to which extent the focus on teachers is compatible with a sociocultural perspective, it should be noted that several researchers in this tradition point to the teacher as a crucial element in the learner's development and that this applies to several approaches within this perspective (Daniels, 2001:106ff).

extremely dynamic and complex situation. Teachers used to have a more transparent environment and stable subject matter prepared in the form of approved textbooks. With globalization and digitally networked technologies, opacity, instability, and uncertainty – but also a greater potential – now seem to challenge their practices (this is illustrated in Chapter 6). Some of the questions that arise were addressed in Chapter 1.2. But such questions cannot be raised or answered in a socio-political vacuum; hence a brief look at the 'official', political discourse that has enveloped the introduction of ICTs in Norwegian education.

1.5. Policies

In Norway, educational policy makers have tended to base ICT integration on an *instrumental* approach to technologies as in the first national plan for IT (sic) in education (KUF, 1995). The second plan (KUF, 2000) pointed to the value of technological literacy from a fiscal point of view as well as an educational one. Both documents approach ICTs from a utilitarian position; there has been a tendency to initiate technology-driven projects and experiments and expect innovations and change in practices conducive to learning to follow. These expectations are not always met. A Norwegian study of schools taking part in a national project on innovative use of ICTs found that learners, teachers and administrators approach ICTs with different intentions and beliefs, resulting in a gap in attitudes to practices (Erstad & Frølich, 2002). The authors conclude that "schools in Norway are presently in conflict between traditional pedagogic means and the outline of something new where ICT plays an important role. One could say that we find ourselves in times where school culture itself is under scrutiny" (op.cit.:44, my translation). In other words, an official, 'institutional' or policy-driven discourse on ICTs is in conflict with an emerging and possibly innovative discourse but where the latter suffers from lack of articulation. Teachers find themselves at the interface of such competing or even contrary discourses.

As for EFL in Norway, English as a school subject has proved to be a long-time companion to ICT-related research and development projects that first started in the mid-1980s. Although no policy papers address this particular knowledge domain (except for some vague suggestions in various curricula, cf Chapter 3.13), English continued to be one of the school subjects addressed in a software-oriented series of workshops initiated by the Norwegian Data Secretariat. Here, development of 'educational software' and an approach that can best be described as 'data driven learning' characterized the efforts (Datasekretariatet, 1987).

While policies as they materialize in curricula, exams, and plans are discussed in Chapters 3.13 and 6.7, this brief introduction should serve to illustrate the techno-economic slant of the ICT-related discourse that originated in the educational policies in Norway.

1.6. Purpose, Rationale and Significance of the study

1.6.1. Purpose

The immediate purpose of this study is to increase our insight in and understanding of what it means to teach English as a Foreign Language in technology-rich environments; i.e. there is a marked didactic dimension to the purpose. The study is *descriptive* in the sense that it aims at describing a phenomenon systematically by first studying a group of teachers in a specific in-service training program – *The Tower* – and then individual teachers at work. But its purpose is also *exploratory* in the sense that it aims to increase our understanding and extend the limits of current knowledge about the phenomenon[9]. However, teachers of EFL should not be so

[9] The term *exploratory* is sometimes associated with pilot studies, initial research carried out to clarify the nature of a problem, and subsequent studies. The reason why it is applied to this study is found in the fact that the field

different from other educationalists that the study does not have a bearing on other teachers encountering technology in their respective subjects as well.

There is also the purpose of adopting and developing a theoretical approach, in the form of a *sociocultural perspective*, to the field of (subject) didactics. Didactics (sometimes referred to as *pedagogy*, particularly in Anglo-American contexts) is a field that has a different history and that carries different connotations across cultures. The present study seeks to use the Vygotskian tradition to contribute to a sociocultural understanding of language teaching (Engeström et al., 1999; Vygotsky, 1986, 1978; Wells, 1999; Wertsch, 1998; Wertsch et al., 1995). This has a direct bearing on the unit of analysis[10]. The individual, the social and the environment are regarded as mutually constitutive and not as separate entities. What is needed is a unit of analysis that allows for a view of human conduct, e.g. learning, as being mediated in complex ways and that involves the use of cultural tools, artifacts, as well as other people (cf Chapter 4.7.2 for a further discussion of the unit of analysis).

It follows that the present study places great emphasis on the theoretical assumptions and constructs that are seen to frame didactics in a sociocultural perspective. To the knowledge of the present researcher there are few (if any) studies that address the compound field of school subject, technologies and didactics from such a perspective. This forms the rationale for a detailed discussion of the perspective chosen. Also, the present study aims to contribute to a mixed method approach to complex phenomena such as appropriation and transformation. The justification for such an approach is pursued in Chapter 4.5. Without linking specific research questions to theoretical and methodological issues, there is clearly a purpose to contribute to both (cf Chapter 7.5).

Finally, in addition to its investigative, analytical and theoretical purposes, the present study also aims at informing teacher education, in the form of pre-service education as well as in in-service training. The intention is to contribute to developing teachers' professionalism and professional identity as technologies make themselves felt in the work of teachers. In the present study, teachers are seen as crucial in assisting, guiding, interpreting, augmenting, and responding to learners' efforts of taking advantage of ICTs. In order to do this they must themselves have appropriated such technologies, and this has a direct bearing on their professionalism.

To summarize, the purposes of the present study are found on an analytical/investigative level as well as a theoretical and practical level. These purposes converge in the broader purpose of contributing to the field of didactics.

As for audience, a multi-disciplinary study such as the present thesis addresses primarily scholars in the field of teaching and learning. The separate domains of ICTs, EFL and didactics are played down in favor of a holistic approach to a compound phenomenon. This may involve scholars in one field finding it taxing to follow the more discipline-specific terminology and accounts of the others. That is also why this study provides some more detail on e.g. approaches to teaching EFL (cf Chapter 3.4.1) than a scholar in this field would need.

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of study is relatively new and that there is not a lot of research to draw on. This automatically adds an exploratory quality to the study.

[10] Vygotsky is often cited for his example of how water cannot be analyzed in terms of hydrogen and oxygen since they both sustain fire while water extinguishes fire. His rejection of dividing units into elements is applied to analyzing thought and language (Vygotsky, 1986:4). This position carries important ontological and epistemological implications.

However, as ICTs continue to infuse school subjects as well as influence approaches to learning and teaching, more cross-disciplinary studies will arguably be called for and, consequently, become more common in research. The present study argues that this will open new horizons for teachers' professional knowledge as well as change our relationships with knowledge in general.

1.6.2. Rationale

When technologies change, they change the way we relate to and act in the world. With refined technologies, we also develop refined intellectual tools in order to make sense of such relations and actions (Säljö, 2002:15-16). The interactive, flexible, and networked nature of ICTs bring about opportunities for accessing, manipulating, and producing information that were beyond the scope of educational systems and curricula designed only a few years ago. Today, local and distributed practices, online and offline spaces are interwoven and challenge notions of identity and culture. Also, ICTs are not just tools that might enhance certain aspects of learning and teaching; they transform our notion of knowledge and how we position ourselves in the face of a transformed concept of knowledge. In other words, ontological and epistemological issues emerge and disrupt well-established and institutionalized views of the core terms of education, e.g. knowledge, curriculum, learning, and teaching.

Consequently, ICTs in education are creating a lot of interest (some would say propaganda or even hype – the amount of money involved is one reason) because of what many educators see as a potential for advancing and transforming learning so that it is more attuned to the 'real world'. Thus, all the more need for knowledge about teaching and learning processes where technology constitutes an integrated part of the learning environment. Being technologically literate is required to participate in working life as well as social life. For instance, as technologies continue to become more or less seamlessly integrated into the way we communicate, the practices involved change (e.g. exchanging, interpreting, choice of register, addressing). The consequence is that our ideas about communication, including in a foreign language, will have to change. Communicative change involves benefits and promises (e.g. creating and sustaining online linguistic communities, linking minds, hearts and hands, democratic potential) as well as risks (e.g. information glut, questionable credibility, censorship, commercialization; cf Burbules & Callister Jr, 2000). Also, "in a post-industrial economy, it has been argued that the linguistic skills of workers at all levels take on new importance", and that "'Communication skills' and the new literacies demanded by new technologies as well as competence in one or more second/foreign languages, all represent 'linguistic capital'" (Block & Cameron, 2002a:5).

But being prepared for economic, vocational and technological change also involves being prepared for social change and the greater challenges of modern life. Teachers have a responsibility to attend to general, formative, as well as the subject specific targets in the curriculum, thereby preparing learners for taking on such challenges. In the present study, this dimension is brought into perspective by drawing on Wolfgang Klafki's *Critical-Constructive Didaktik* (Klafki, 1998, 2001). Klafki brings a democratic and reflective dimension to didactics by addressing some of the pressing concerns of humanity (e.g. ecology, peacekeeping, poverty) and how confronting such issues is part of the formational aspects – *Bildung* – of didactics. In a networked, global world such issues are increasingly carried and spread by ICTs, sustained by languages and in particular English. Consequently, the rationale for the present study is found in the crucial role teachers play on linguistic, technological, vocational, social and global levels. The perspective might seem daunting to most teachers. However, such issues and teachers' abilities to cope with them are gradually emerging in literature on didactics, pedagogy, and teacher education (Candlin & Mercer, 2001; Cope &

Kalantzis, 2000; A. Edwards et al., 2002; Klafki, 1998, 2001; Lankshear, Snyder, & Green, 2000; Leach & Moon, 1999). The point is summarized by A. Edwards et al.:

> *We are therefore, tentatively at least, arguing for more teacher education; for a teacher education which is informed by close-to-practice versions of the social sciences, (…) for a teacher education which is not limited to curriculum and how it is delivered; and for a teacher education geared towards creating teachers who seek and interrogate uncertainty (A. Edwards et al., 2002:134).*

As for studying teachers of EFL in particular and their encounters with ICTs, the rationale is found in the following arguments:

- English is one of the obligatory subjects in the Norwegian school system, from the very first year and into upper secondary school where it is also offered as an elective, in-depth subject the last two years. The various curricula of EFL describe English as advancing proficiency skills as well as formative/cultural aspects. This double focus places the foreign language close to a first language position and in a perspective of what it means to be literate in the 21st century.
- English is a global language, in constant flux and with a multitude of variants (Crystal, 1998, 2001a, 2001c; Graddol, 1997, 2001). On the Internet, it has no competitor regarding the number of native speakers or number of web pages in English (Global Reach, 2002). Thus, English as a school subject is one of the most central disciplines where subject matter and technologies meet.
- It follows that learners today will encounter and familiarize themselves with the world largely through the use of (variants of) English mediated by a diversity of digital technologies. This makes EFL an important epistemological lens for the 21st century.
- Subject didactics is a complex and competence-intensive field that now also requires teachers to be prepared for teaching and learning in technology-rich environments. English as a school subject has – at least in Norway – been one of the subjects most often included in innovative projects, research and development. There is quite some accumulated experience of EFL teachers encountering ICTs in in-service training and/or their practices. To scaffold learners' progress in EFL, teachers of English at all levels need to be knowledgeable about computer-assisted language learning (CALL) and the roles played by ICTs in general. This is not just adapting ICTs to existing practices but entails an appropriation of technologies that exploit their transformative and future-oriented potential. Such processes are molded in the tension between tradition on the one hand and innovation on the other, and how they are informed by the learning environment teachers are part of. Also, such processes are not very well documented and analyzed and, therefore, insights in such processes constitute the principal rationale for the present study.

1.6.3. Significance

On a *theoretical level*, the present study argues that didactics is in need of a socioculturally based concept of knowledge in which the teaching/learning dichotomy is suspended. As technologies create opportunities for easier access to information, for how we exchange and produce information, knowledge becomes re-defined as *coming-to-know* in participatory processes that depend on our ability to explore and exploit the mediating tools involved. Teachers are seen as crucial in such endeavors. Technologies change according to the historical and social conditions that shape and sustain changes. To understand how teachers face such changes requires a theoretical perspective that does not separate the individual and the collective, people and environments, cognition and activity. While substantial and

valuable research has been carried out on such general issues, the present study argues that it makes a theoretical contribution to understanding the position of a *teacher* and a *school subject* and how classrooms become *reconfigured*, in such a framework.

On a *methodological level*, the present study should be significant in its combination of qualitative and quantitative approaches, an eclecticism that aims at capturing several refractions of a phenomenon. The overall methodological profile is qualitative in the form of classroom ethnography, but quantitative methods are used in order to capture the beliefs of a sample of teachers. The outcome of the quantitative study is intended serve as a backdrop, a 'bigger picture' of the concerns teachers have when encountering ICTs. According to some researchers, a mixed method is necessary to capture the complexities involved when humans, tools and environments are seen as mutually constitutive to processes such as learning (Burbules & Callister Jr, 2000; Russel, 2002; Tashakkori & Teddlie, 1998). Exactly how different methods inform each other and to what extent a particular theoretical perspective assumes or excludes certain approaches are issues that may not (or cannot) be resolved (cf Chapter 4.5 for a discussion). Still, the present study argues, through its use of several research methods, that complementary approaches may carry a lot of potential when analyzing dynamic phenomena that appear at individual as well as collective and institutional levels.

On a *practical level*, the present study intends to provide a contribution to the field of subject didactics of EFL including teacher education and in-service training. The turnover rate of technological innovation is extremely rapid, so strategies for teachers' lifelong appropriation of tools and renewed practices are needed. The present study should be relevant when drawing up plans and designing programs for teacher education and training so that an informed view of ICT integration can guide teacher development. A merely instrumental approach is seen as highly insufficient and as one that misses out on the complexity, transformative potential and emerging understandings of knowledge and learning. With its ambition to take on such issues, relate them to didactics and made visible through the lens of a particular subject, the present study expects to make a contribution to a field not well researched but one that will have a direct, concrete impact on how we support teachers in their endeavors for developing a higher level of professionalism.

1.7. Definition of terms

The present study draws on several fields, each with its heritage of scholarly terms and constructs. For instance, a specific theoretical perspective will develop its own set of metaphors and constructs to enhance its distinct position but this may also result in impeding an outsider's or newcomer's immediate understanding of the issues involved.

In the present thesis, care has been taken to explain 'proprietary' terms as they turn up, e.g. *abduction, acquisition, appropriation, artifact, zone of proximal development* etc to name but a few terms from methodological, linguistic and theoretical domains. However, it is necessary to define some 'common' notions used throughout the present study, since they carry a particular perspective. Table 1.1 below introduces some common terms, as they are understood in the sociocultural perspective that permeates the present study. It draws heavily on features of a "sociocultural pedagogy" as developed by A. Edwards et al. (2002) and also views on learning and language as presented by Lantolf (2000), Thorne (2002b) and Gumpertz and Levinson (1996a):

Table 1.1 Definition of key terms in the present study

Language	A human social-semiotic, socially constructed system of conventions, coded into speech acts that convey a cultural inheritance to be communicated to others
Foreign language	Signs, codes, conventions, and speech acts that have been created by a different culture and involves different user identities
Learning	Transformation as increasingly informed participation in the practices of a community including the potential to change them
Learners	People who appropriate, interpret and respond to their environment in new ways
Knowledge	Something recognized, appropriated and generated through participating in social practices
Didactics	A social practice in which learners, teachers and artifacts are configured around a knowledge domain, and in which knowledge building is made visible by grouping knowledge into educational subjects
Teaching	A process of making judgments about the strategies to be used to assist learners' increasingly informed interpretations, responses, and actions and how to exploit affordances [11] in order to support specific kinds of participation
Teachers	People who assist the interpretations, responses, and actions of learners, e.g. by designing, explaining, and manipulating learning environments
Community	A set of practices, e.g. as materializing in an EFL community, in a classroom, or a professional community of teachers jointly appropriating ICTs
Learning environments	Sets of opportunities for participation which may provide varying degrees of freedom of action

The fields of EFL, ICTs and didactics are permeated by abbreviations and acronyms. Some commonly used items are explained in Table 1.2 (below) while others will be spelled out as they appear.

[11] The term affordance is attributed to the psychologist James Gibson who used it to refer to a reciprocal relationship between an organism and features in its environment. Affordances hold the potential for triggering action, e.g. human legs and a ladder afford climbing. It should be noted that compared to Gibson's initial biological use of the construct it has in sociocultural theory gained a marked cultural flavor, cf Chapter 3.5.1.

Table 1.2 Key abbreviations and acronyms in the present study

CALL	Computer Assisted Language Learning (sometimes referred to as TELL – Technology Enhanced Language Learning). A key term that cloaks important issues of change, but persists in scholarly literature and is therefore kept in the present study (cf Chapter 3.7.1)
CSCL	Computer Support for Collaborative Learning. A view of educational technologies that focuses on their mediational role within collaborative learning processes
EFL/ESL TEFL/TESL	English as a Foreign Language and English as a Second Language. There are historical reasons for the separation of the two, but in the present study this distinction is suspended and EFL is used for both (cf. Chapter 3.4). The same applies to Teaching EFL/ESL
ICTs	Information and Communication Technologies. Usually reserved for digitally-based hardware and software
L1/L2	First language ("mother tongue") and second language. In the present study, L2 would cover EFL
SLA	Second Language Acquisition. Primarily research into the way people learn a language other than their mother tongue, but also used in language didactics. In the latter case the term covers several approaches, from structural to communicative and usually conceives of language as a product to be acquired

Finally, the use of one particular word should be explained: *traditional*. The term is used throughout the present study, sometimes as a contrast to innovative and/or ICT-intense practices or settings, sometimes to describe an established or institutionalized view. It is important to note that when used, the word *traditional* is **not** intended to sound derogatory. It is simply used in its etymological sense of carrying a certain heritage, handing down an inherited, established, or customary pattern of thought, action, or behavior.

1.8. Delimitations and limitations

The previous sections have placed the present study within a social as well as a pedagogic scope and with the assumption that a particular phenomenon, teachers' appropriation of ICTs, is somewhat under-reported and not well understood. With ICTs having increasingly more impact across school subjects, social processes, and working practices research into ICT-infused issues runs the risk of being too all-embracing. Therefore, due to the cross-disciplinary nature of the research object, the present researcher has chosen to impose certain restrictions in order to keep focus on the research questions.

Three distinct fields meet in this study; English as a Foreign Language, Computer Assisted Language Learning, and Didactics. It is the points and boundaries - the *interfaces* - at which they converge that constitute the focus of the study. While this approach may narrow the horizon represented by the separate disciplines, it is a delimitation that is chosen in order not to blur the focus of the research issue.

Also, the sample of teachers studied imposes certain delimitations on the findings. The teachers who participated in *The Tower* course and the three teachers observed in classroom practices may not be typical of their colleagues. What these teachers have in common is that

they – after having taken part in *The Tower* course – are *not novices* when it comes to ICTs. They carry a potential for more informed implementation of ICTs in their practices than newcomers. While this constitutes a delimitation of the study it opens up for a sharper focus on how more knowledgeable teachers come to regard and use ICTs. Also, the voluntariness of the teachers who took part in the survey and the fact that three of them opened their doors for classroom research may set them apart from teachers who did not take part or might have objected to observation. This purposive sampling (Kumar, 1996:162) rests on the researcher's judgment as to who might provide the most salient information.

Limitations may also be found in the characteristics in the sample. The survey was conducted within a four to six month period after participants had completed (or, at an earlier stage, dropped out of) *The Tower* course. The level of commitment might at this time have been higher than e.g. a year or more later. This synchronous, static description may not capture longitudinal beliefs and attitudes of the sample.

Social phenomena may be studied on several levels. For instance, teachers can be studied individually as agents and actors, they can be studied collectively, and they can be studied at institutional level; how they form an integrated part of the larger activity system of a school or national policy. All these levels are to some extent present in this study, adding up to a multi-level approach (cf Chapter 4.7.1). However, the focal point is mainly the *interactions* that teachers enter into. Thus, the collective element is always present.

It is also important to note that some questions are not addressed. For instance, based on the premises of this study questions that ask whether pupils "learn better", "learn faster" etc with or without ICTs are not addressed. In fact, they are seen as irrelevant in this context as ICTs are seen as transforming the learning experience so that comparisons do not hold; learning experiences are not comparable. There is a tradition within the CALL field that focuses on educational software and its potential for enhancing language acquisition. The present study does not address such issues.

Finally, there might be a methodological limitation in the order of sampling events. In this study, the quantitative survey was conducted before turning to classroom research. This was done for practical reasons; the researcher wanted to do the survey while *The Tower* course was fresh in the participants' memory and its impact was felt. The other way round, constructing a survey based on salient findings in studies of classroom interaction, might have improved the overall validity of the questionnaire used for the survey. For a more detailed treatment of validity and related issues, see Chapter 7.4. As for the remainder of the present study, a brief outline of the chapters follows.

1.9. Overview of study

Chapter 2, Theoretical positioning, establishes the sociocultural perspective as the theoretical lens for the present study. A historical and conceptual approach to seeing the mind as social and situated is followed by a discussion of ontological and epistemological aspects of such a view. Key terms are explained before the theoretical lens is directed at the phenomenon, the object studied, as described in Chapter 3.

Chapter 3, At the intersection of school subject, technologies and didactics, describes the three elements that make up the compound environment that embeds the teachers in the present study. Firstly, the chapter addresses recent trends in English as a world language. Secondly, some aspects of teaching EFL are presented. This is followed by an account of how

ICTs have come to influence education and language learning. The chapter argues that the situation calls for new types of literacies before discussing how the field of didactics will be influenced by the changes in and the convergence of the three elements. In many ways, this chapter can be read as a variant of 'the state of the art' and its accompanying literature. By following three strands the chapter focuses on their intersection as the (so far) under-researched field.

Chapter 4, Methods and methodology, describes how the theoretical lens is applied to the compound field presented in Chapter 3 and the research methods used to analyze it. The role played by the present researcher is discussed followed by a review of key metaphors that guide the analysis. Next, the research design in the form of *Mixed Methodology* is discussed before turning to the various types of data that make up the empirical base of the present study. The chapter ends with a reflection on the complexity of the phenomenon under examination, the multi-level approach and the unit of analysis that might capture such complexity.

Chapter 5, The Tower survey, is devoted to a descriptive, statistical analysis of a sample of teachers who took part in an in-service training program called *The Tower*. The course, consisting of seven modules, sought to increase teachers' competence in teaching EFL in ICT-intensive settings. The survey aims at eliciting views and beliefs teachers of EFL have about technologies and teacher roles when integrating them. This is followed by a discussion of unstructured data collected from an online discussion group for *The Tower* participants before findings are discussed.

Chapter 6, Classroom encounters, is an analysis of classroom activities at two secondary schools. Three teachers who participated in *The Tower* are observed as they practice in technology-rich environments. Teachers' designs for learning activities and how these manifest themselves in the classroom are analyzed with a view to the transformed classroom and the type of expertise that is required to cope with such transformation.

Chapter 7, The EFL classroom in transformation, sums up themes that run through the present study of teachers' encounters with ICTs. Issues of validity are raised before pointing to contributions of the study. The chapter concludes by pointing to implications for teaching and learning EFL in technology-rich environments and implications for teacher education and in-service training.

1.10. Conclusion

Since the advent of ICTs and the Internet in particular, the educational sector has been expected to use such technologies. Increasingly however, with ICTs learning opportunities are found in out-of-school contexts. Besides, networked ICTs suspend constraints of time, space and culture and (therefore) involve complexity and uncertainty. The social settings of educational endeavors change, and our social relations change with them. School subjects change as new information is transformed into new knowledge. Cultural tools, artifacts, such as ICTs accumulate human knowledge and they also possess inherent possibilities for solving new and complex tasks. New perspectives on learning and teaching emerge as knowledge becomes externalized in and distributed by such tools. As ICTs become increasingly more

sophisticated, networked, wireless, smaller[12], and inexpensive we will continually have to redefine and reconfigure what counts as educational practices.

The present study does not ask if and to what extent ICTs should be integrated in educational practices. At the risk of being flippant, one could just as well ask similar questions relating to the printing press or the ballpoint pen. The point is that technologies are not just added to; they are an inseparable part of human conduct. However, one fundamental question is from what set of premises ICTs should be approached. For instance, much of the written work referred to in the present study sees ICTs as essentially a boon; their conducive effects on learning are seldom questioned, although some studies address the more problematic nature of ICTs (Burbules & Callister Jr, 2000; Cuban, 2001; Schofield, 1995; Warschauer, 2000c). In the present thesis, ICTs are seen as artifacts that have the potential to transcend and transform existing practices. However, such potential does not automatically materialize in educational practices. This is a different set of premises than those that align themselves along a dichotomy of benefits and shortcomings. In addition, the transcending and transforming potential of ICTs is not restricted to classroom practices only, but seen as affecting the nature and status of a knowledge domain (such as EFL) as well; i.e. there are ontological as well as epistemological implications.

In such a situation, the teacher may feel insecure, obliterated, and provoked or perhaps feel renewed, challenged and inspired. Teaching practices may stay the same, as a defense mechanism or as a sign of insecurity. But practices may also change as teachers try to grapple with and utilize new learning environments to design meaningful and valuable situations for learning. Paradoxically, uncertainty is the only invariable factor for teachers as they traverse the interfaces of online and offline environments, of in-school and out-of-school practices, and of traditional and emerging literacies. In their efforts to redefine teacher education A. Edwards et al. ask the following question: "how might teacher education respond to the need to create learners able to generate as well as use knowledge?" They also provide an answer:

> *The question is answered by invoking sociocultural interpretations of teaching and learning which see relationships between learners, teachers, knowledge and contexts as a dynamic weaving together of opportunities and constraints which shape both thinking and learning (A. Edwards et al., 2002:9).*

What follows is an attempt to invoke such an interpretation.

[12] One particularly intriguing trend is how technologies also enter our bodies. While this is obviously an issue beyond the scope of the present study, the implications for education are profound.

2. Theoretical positioning

> *(…) the quality of a theory is determined by the state of development of the particular discipline. The early stages of a science must be dominated by empirical work, that is, the accumulation and classification of data. This is why, as we shall see, much of educational research is descriptive. Only as a discipline matures can an adequate body of theory be developed.*
>
> *Cohen & Manion (1994:16)*

> *Nothing is as practical as a good theory.*
>
> *Kurt Lewin, quoted in Jensen (2001:274)*

2.1. Introduction

As the introductory quote argues, educational research is in its early stages. So is the case regarding the theoretical, sociocultural perspective chosen for the present study. Hence, the present chapter conceptualizes some of the principles and key tenets that are relevant for the research issues involved.

To understand teachers' encounters with ICTs, a theoretical perspective is needed in order to obtain a principled and systematic view of the phenomenon studied. Also, the theoretical perspective will influence the choice and application of methods as well as the unit of analysis. The inner consistency of research questions, theory, method, and unit of analysis should bring a sense of unity, cohesiveness, and rigor to the study as well as a foundation for assessing its strengths and weaknesses (cf Chapter 7.4 on validity). Also, a particular theoretical perspective affords certain interpretations of the phenomenon studied while discouraging others. Theoretical perspectives have ontological and epistemological implications (that will be discussed below, cf 2.2.7). Consequently, certain *theoretical* positions are difficult to combine, or might be mutually exclusive. A *methodological* eclecticism, however, may be applied as long as it adheres to the perspective chosen. In other words, both quantitative and qualitative methodologies might be subsumed under one theoretical perspective while combining e.g. cognitive and sociocultural theoretical frameworks might blur the distinctiveness of different scientific understandings and hence threaten the robustness of the study.

The present chapter seeks to explain, justify, and elaborate key concepts in *a sociocultural perspective* on the study of teachers' encounters with and *appropriation* of ICTs. The sociocultural perspective will be elaborated, sought justified, and critiqued in this chapter with emphasis on constructs that are found to be particularly useful to the study of teachers' encounters with ICTs and the subject didactics they form a part of. Roger Säljö states that the term sociocultural can be understood in more ways than one, but that central to the perspective is

> *(…) how humans take part in and are formed by participating in cultural activities and how they make use of the tools that this culture offers.*
>
> *Thus, a point of departure for a sociocultural perspective on learning and human cognition/action is an interest in how individuals and groups acquire and exploit physical and cognitive resources. And it is this interplay between the collective and the individual which is in focus within such a perspective. (Säljö, 2000:18, my translation).*

The following sub-chapters first present a general sociocultural perspective with an emphasis on its historical and conceptual roots, including a discussion on issues of ontology and epistemology. Next comes a section where key concepts relevant for the research field and questions are elaborated. Finally, some relevant questions and critique are briefly treated.

2.2. What is a sociocultural perspective?

In his book, *Dialogic Inquiry. Toward a Sociocultural Practice and Theory of Education*, Gordon Wells (1999) repeatedly stresses the view that theory can be seen as the researcher's zone of proximal development, ZPD (cf Chapter 2.3.6), a tool that scaffolds our quest for making meaning:

> *(…) theories, like all other artifacts, are the products of the particular conditions in which they are created; if they are to be useful in other times and places, therefore, they must be treated, not as repositories of truth that are fixed and immutable but as helpful tools for thinking with, which can themselves be improved in the process (op.cit.:334).*

What is here said about research as social practice mediated by scientific artifacts can serve as an introduction to a sociocultural perspective in the social sciences and, more specifically, in education. However, before this particular perspective is discussed, a few additional words on the concept of theory are needed in order to clarify its status in the present study.

2.2.1. Theory

A common-sense understanding of the term *theory* might be articulated as a particular way of thinking, or as "generalized conceptions of what the world is like, and how things can be done" (Jensen, 2002:274). However, definitions of the term differ as a theory obviously is a social construction reflecting a particular science at a particular time. In the words of Cohen and Manion,

> *theory is itself a potential source of further information and discoveries. It is in this way a source of new hypotheses and hitherto unasked questions; it defines critical areas for further investigation; it discloses gaps in our knowledge; and enables a researcher to postulate the existence of previously unknown phenomena (Cohen & Manion, 1994:15).*

These qualities of 'emergence' and interpretation point towards a constructionist view of social sciences. However, constructionism is a minefield of a term with its many interpretations[13].

Mats Alvesson and Kaj Sköldberg (1994) discuss theories in relation to an extended and more complex understanding of 'truth'. They point to three perspectives where truth can either be understood as 1) a concept corresponding to reality, 2) a pragmatic concept in the form of a criterion for applicability, or 3) truth as discovery of (concealed) meaning. Reviewing the concept of theory, the authors state:

[13] A note on the terms 'constructivism' and constructionism' is necessary, since usage varies and they tend to cause confusion. *Constructivism* is here taken to mean the educational and cognitive theory of Piaget with its emphasis on learners constructing new knowledge based on already acquired knowledge and by taking control of their own learning. *Constructionism*, on the other hand, is used in two quite different contexts. First, it is used as a broad term for a particular theoretical perspective in which constructivism is extended to form a view of how humans construct reality. This is how the term will be understood in this study. Second, constructionism is associated with Seymour Papert and his emphasis on the role of constructing a shared artifact, something that others will see, use, discuss and develop. This is constructionism at a methodological level, and not at the (previous) theoretical level.

> *To summarize, theories can place more or less emphasis on the three perspectives of truth – correspondence, applicability, and meaning. We call this three-sided view* the trilateral concept of truth. *Our position is that all sides constitute integrated parts of a research process, and that attempts at completely dismissing any of them are harmful to the process. An extreme positivism eradicates e.g. the meaning side at the expense of explanation. An extreme constructionism completely neglects the correspondence side, and consequently risks ending up in personal opinion. An extreme utilitarian type of research misses meaning and explanation, and hence knowledge aspects, in its unilateral focus on the practical value of scientific results (op.cit.:38, my translation, emphasis in original).*

This trilateral view of truth and theory is the one adhered to in the present study, but with an emphasis on meaning-making and discovery of patterns. The research question of what happens when teachers of EFL try to integrate ICTs in their practices is primarily a question of meaning-making. Immediately, questions regarding where meaning resides, how it can be studied and analyzed, start to form. For these purposes, a more distinct theoretical perspective on ontology and epistemology is needed. But the current research questions (cf Chapter 1.2) are raised from a theoretical position where a social reality is taken to exist. It is not just constructed or narrated (although *versions* obviously are constructed all the time), but has a material basis. Further, these questions are raised in the hope that they will yield practical results in the sense that findings can inform teacher education, training and learning as well as policy makers when they plan and introduce educational reform or development.

What theoretical lens to employ when making a study of teachers' encounters with ICTs? At the risk of anticipating events, teachers' encounters with technology form a collection of accounts that seems to carry a common theme; transformation of practices. Such transformation takes place through human interaction mediated by technologies. Practices are formed and sustained partly by the learning environment (configuration of people and tools) in which they materialize, partly by the beliefs, convictions, approaches – intentions and gut feeling included – that teachers bring into said environment. Consequently, we need a level of description that aims at capturing the activities involved and how such activities develop through mediated, human interaction. We may follow neurons traversing the synapses of the brain, but we cannot make sense of the movements from brain activity alone. We may feed people certain impulses and see reactions without gaining insights about the learning processes. We may study a child grapple with a problem without understanding the social importance of learning. What a sociocultural perspective can offer is a multilevel type of description that captures what people do, how they address others, how they respond to others addressing them, and how they take part in processes mediated by a plethora of cultural tools, artifacts. The interplay between the individual and the social, humans and their environment becomes a key to understanding complex processes such as learning, teaching and meaning-making in general. In these continuous efforts, artifacts are carriers of historically accumulated and culturally shaped knowledge and can ease the cognitive load and be conducive to further development.

The present study seeks to elicit beliefs about as well as examine educational practices in technology-rich environments. It addresses individuals as part of groups and as part of institutional discourses, and it seeks to analyze activities within the settings (class, school, in-service training) they are enacted. As indicated by the quote from Gordon Wells (above), this means that a sociocultural perspective is not only used as a perspective from which to study a phenomenon. It also serves as the researcher's object to think with, to guide a certain type of inquiry, thereby taking on a double role in the present study. This type of sociocultural

research is defined by James V. Wertsch (1995:56) to be the study of "the relationship between human mental functioning, on the one hand, and cultural, historical, and institutional setting on the other". A core element in such an approach is the view that human higher order functions (e.g. learning a foreign language) develop in social interaction, embedded in social events.

Finally, as the short historical overview will show, a sociocultural perspective is not a monolithic or clear-cut, unambiguous theory despite certain well-defined constructs. It is a perspective that needs to be explicated and compared to other perspectives like e.g. behaviorism and cognitivism. For instance, regarding the unit of analysis, behaviorism focuses on how stimuli (or lack of) determine behavior; cognitivism focuses on (mostly individual) mental processes, while a sociocultural perspective does not separate the two but views individuals and contexts as mutually constitutive[14]. Also, it represents a fairly recent perspective (although there are historical precedents) on learning and teaching, foreign language acquisition included, and needs to be qualified with regard to the purpose of this study and the methods applied. Consequently, a sociocultural perspective will throughout this study be treated as a broad but *distinct perspective* and not as a theory with *paradigmatic* status. The following sub-chapters will discuss some aspects of a sociocultural perspective in more detail.

2.2.2. History: the sociogenetic assumption

Im Anfang war die Tat

Goethe, quoted in Valsiner (2001:124)

"There has been considerable discussion about the term 'sociocultural' – what it means, who it belongs to, and the intellectual lineage it is emergent of." (Thorne, 2000b:239). Today the term 'sociocultural' has become a generic label for a cluster of related theoretical positions that encompasses e.g. cultural psychology (Cole, 1996), situated cognition (Greeno, Collins, & Resnick, 1996), distributed cognition (Hutchins, 1995; Salomon, 1993), and activity theory (Engeström et al., 1999)[15]. In addition, there is a body of literature that deals with general characteristics of sociocultural theory (Lave & Wenger, 1991; Valsiner & van der Veer, 2000; Wertsch, 1998; Wertsch et al., 1995) as well as sociocultural perspectives on learning (Säljö, 2000; Wells, 1999), foreign language learning (Debski, Gassin, & Smith, 1997; Hall & Verplaetse, 2000; J.P Lantolf, 2000; Lantolf & Appel, 1994), and the teaching of English (Burns & Coffin, 2001; Candlin & Mercer, 2001). It is also important to note that the field of CSCL – Computer Support for Collaborative Learning – is deeply infused with sociocultural perspectives (Koschmann, 1996b; Lehtinen et al., 1999; Stahl, 2002).

Since the present study adopts a sociocultural perspective on (subject) didactics it is important to link this perspective to earlier sociocultural scholars and see what constructs and assumptions they offer. Our interpretations of present phenomena are always made in terms of the past; this is the cultural-historical embeddedness of all theory.

[14] The unit of analysis in the present study will be dealt with in detail in Chapter 4.7.2.

[15] Thanks to Sten Ludvigsen for pointing to these variants of sociocultural approaches. The works cited are generally regarded as seminal to the field; they do not represent the richness of literature on sociocultural perspectives. Harry Daniels (Daniels, 2001:69-70) provides a slightly different categorization; cultural-historical activity theory, sociocultural approaches, situated learning, and distributed cognition.

While sociocultural theory in many ways has become synonymous with the theoretical work of Russian psychologist Lev S. Vygotsky (1896-1934), Jaan Valsiner and René van der Veer (2000) show that it can be traced throughout the 19th century in Europe[16], especially among French psychologists who in the wake of military defeat to Germany in 1870 and the Paris Commune in 1871 became fascinated with "the way feelings and ideas travel through populations" (op.cit.:59). Studying the social mind and in particular intellectual interdependency, how *the idea* is socially constructed, the authors discuss four key theorists and how they relate to each other through the concept of *sociogenesis* – "the social genesis (i.e. development, emergence) of the person" (op.cit.:3). With its emphasis on *emergence* of psychological phenomena and their *social origin* sociogenesis is at the heart of a sociocultural perspective, and has implications for how we come to (re-)consider didactics (cf Chapter 3.9).

The roots of sociogenetics can be found in the work of several European and American scholars. For instance the French psychologist Pierre Janet (1859-1947) argued that *all mental acts are originally social,* that *all human conduct is originally related to actions,* and how *mental processes are culturally based and "extracerebral"*[17]. Valsiner and van der Veer (op.cit:123) note that this is a departure from the Cartesian dualism and *cogito* (I think) towards an epistemology of *ago* (I act): "Thought did not exist in the beginning; it existed in the end. It was a late development" (Janet quoted in Valsiner 2000: 124). This is a central tenet in sociogenetics.

Similar ideas were expressed by James Mark Baldwin (1861-1934), a close intellectual partner of Pierre Janet. He shares the negation of Cartesian dualism of mind and body and argues for the unification of person and social world. Through a dialectical view[18] he "had no difficulties reconciling the personal (intrapsychological) and the social (interpsychological) facets of human development." (op.cit.:155). Also, Baldwin was especially interested in relationships between the 'outer' and 'inner' experiences, and imitation processes. According to Baldwin this is not a matter of just copying a conduct, but a process where the subject has an *interest*, an orientation towards the experience. This process parallels Bakhtin's notion of *appropriation* (cf Chapter 2.3.5), a process whereby humans acquire the use of material or intellectual tools, originally developed by others, and transform them to meet subjective needs.

[16] According to R. Keith Sawyer, the American Charles Horton Cooley may have been the first to claim that man has no existence apart from a social order, and can develop his personality only through social order: "'Society' and 'individuals' do not denote separate phenomena" (Sawyer, 2002:5)

[17] More current, socioculturally inspired understandings of development acknowledge (in line with Vygotsky) that a first level would be biological, controlling our bodies. However, as the child starts interacting with contextual elements biology gives way to a sociocultural notion of mind and its development (Säljö, 2000:35-36).

[18] As this study argues for a complementary qualitative and quantitative approach, it is also interesting to note Janet's views on methodologies: "The … quantitative method, brought over into psychology from the exact sciences, physics and chemistry, must be discarded; for its ideal consisted in reducing the more complex to the more simple, the whole into its parts , the later evolved into its earlier-existent, thus denying or eliminating just the factor which constituted or revealed what was truly genetic. Newer modes of manifestation cannot be stated in atomic terms without doing violence to the more synthetic modes which observation reveals" (Valsiner & van der Veer, 2000: quoted on page 158-59).

American pragmatism[19] also entertained sociogenetic views. George Herbert Mead (1863-1931) along with Charles Peirce (1839-1914), William James (1842-1910), and John Dewey[20] (1859-1952) are considered the founders of American Pragmatism. There are some particularly relevant issues for didactics and language learning in Mead's thinking. For instance, he addresses the teacher – learner relationship in exchange terms, calling attention to the social interaction between learner and teacher and how the teacher tries to reshape knowledge in accordance with the learner's abilities and qualifications. This suggests a joint interpretation where the teach/learn dichotomy is suspended. For the present study, this is a key point (cf Chapter 3.10), since it resurfaces in technology-rich classrooms.

But just as the person is a dynamic concept in a sociogenetic view, so is the environment. Context is not something static that determines an agent's actions but "By acting upon its environment, the organism (in biological evolution) and the person (in social conduct) change that environment, and through it, change themselves" (Valsiner & van der Veer, 2000:265). And when agents act upon the environment for some purpose, it changes and hence produces new affordances to be exploited by agents. These observations are important because they imply a particular view of didactics as a process where learner, teacher and context engage in processes of transformation that produce certain affordances. With his focus on the emergence of environments, humans as social organisms, and the mutually transformative potential of agents and environment Mead (along with other pragmatists, notably Dewey) has contributed to a sociocultural perspective on didactics.

Much of what has been written above has been attributed to the Vygotskian tradition in psychology and education. Lev S. Vygotsky (1896-1934) refined the theories of man as a tool-using social being and how language affords and constrains thinking (Vygotsky, 1972, 1978) but died before they formed a complete system. Typically, his seminal concept of the *zone of proximal development*, *ZPD*, was never operationalized by Vygotsky. There is a rich literature on the man and his influence[21] but for the present study his relevance for didactics, in particular the ZPD, will be discussed (cf Chapter 2.3.6). A Vygotskian view entails that any activity is the product of several levels of development; phylogenetic (the evolution of a species), sociogenetic (cultural), ontogenetic (individual), and microgenetic (instances). These levels are interrelated and presuppose one another in the order above. Thus, individual cognition is considered the result of social and cultural processes.

[19] American Pragmatism and its importance for the social nature of mind are treated by Valsiner & van der Veer as an example of how sociogenetic ideas appeared in non-European contexts. They attribute pragmatism with its focus on *utility*, practical outcome as the core of truth and falsification to the American "tension between 'social control' (…) and 'individual choice' (…) the social nature of human individuality" (Valsiner & van der Veer, 2000:191).

[20] In his declaration *My Pedagogic Creed (Dewey, 1897)*, Dewey is explicit on the social mind. The following are but a few quotes from *Article I, What Education Is*: I believe that all education proceeds by the participation of the individual in the social consciousness of the race. […]the individual gradually comes to share in the intellectual and moral resources which humanity has succeeded in getting together. He becomes an inheritor of the funded capital of civilization. […]I believe that the only true education comes through the stimulation of the child's powers by the demands of the social situations in which he finds himself. Through these demands he is stimulated to act as a member of a unity, to emerge from his original narrowness of action and feeling, and to conceive of himself from the standpoint of the welfare of the group to which he belongs. Through the responses which others make to his own activities he comes to know what these mean in social terms.[…] I believe that the psychological and social sides are organically related and that education cannot be regarded as a compromise between the two, or a superimposition of one upon the other.

[21] See e.g. (Daniels, 2001; Kozulin, 1990; Moll, 1990; Wertsch, 1985).

Vygotsky used the Russian linguist Aleksandr Potebnya (1835 – 91) as a source of ideas. Specifically, Potebnya's notion that language externalizes and objectifies ideas became important to Vygotsky. This happens through three steps. First, through the language of a particular culture, thus making ideas accessible to a community. Second, one single language is confining and by making use of a second or third language we transcend constraints of the first. This 'liberating' perspective is an extremely interesting view with regard to foreign language didactics. Third, words also objectify thoughts for the speaker and become a prerequisite for understanding the self. It is important to note that to Vygotsky, the word is not a static entity. It changes according to user and context (Vygotsky, 1986:217-18). The focus on the word as the single most important unit (instead of e.g. utterance or phrase) is today contested and regarded as too narrow. But the principle of language (and tools in general) as a prerequisite for cultural development holds firm. Through language, mental processes merge with cultural and social processes, but in a certain sequence:

> *Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level: first,* between *people (*interpsychological*), and then* inside *the child (*intrapsychological*). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relations between human individuals (Vygotsky, 1978:57, emphasis in original).*

This has been referred to as "the general sociogenetic law of cognitive development" (Kinginger, 2002:243). Its two stages represent a model of development where the child or learner can be assisted in her progress. Therefore, Vygotsky places great emphasis on instruction and the formal setting of a school as conducive to bringing the learner in line with a historically specific culture. According to Vygotsky, education and instruction leads development and the teacher's role in such scaffolding processes is emphasized.

The above brief historical survey seems to indicate that sociocultural perspectives can be found somewhere between Marxism[22], (Vygotsky, Leont'ev[23]) and American pragmatism (Dewey, Mead). In particular, Engeström (1999:3) acknowledges Marxism: "First and foremost among the philosophical roots of activity theory is the work of Karl Marx". Without going into the tensions that might exist between the two directions it is interesting to note that what they have in common is the inseparability of mind and society. Engeström points to this when he states that:

> *Many of the ideas of pragmatism have common features with activity theory. The program of "Transcending the dualisms" between thought and activity, theory and practice, facts and values has much in common with the theoretical aims of activity theory. John Dewey and George Herbert Mead developed conceptions of action, of practice, and at times even of collective activity (Engeström, 1999:5-6).*

[22] In fact, at the 8th Annual Meeting of the Sociocultural and Second Language Learning Research Working Group the plenary discussion was headlined as *Are We Marxists? Does it Matter?* (Sociocultural and Second Language Learning Research Working Group, 2001). The meeting went on to discuss to what extent the Marxist influence was primarily historically or theoretically significant for sociocultural theory and activity theory in particular.

[23] A.N. Leont'ev (1904 – 79) is generally considered to be the originator of activity theory (cf Chapter 2.2.5). Activity theory moves beyond the individual and studies human development in terms of collective activity systems where subjects, goals, and tools are part of a larger system of rules and regulations, division of labor and the particular microworld they are embedded in. In accordance with Marxist theory, activity theory places emphasis on the circumstances surrounding the execution of actions. Activity linked to social context becomes the unit of analysis for the study of human conduct. After collaborating with Vygotsky, Leont'ev fell out with him in 1933 on the grounds that he felt Vygotsky's ideas were too focused on isolated actions and skills.

Action, practice, and activity all assume *participation*. In a sociogenetic view, participating in social practices, then, becomes the focal point when studying human conduct. This will be treated next while ontological and epistemological consequences of this position are discussed in Chapter 2.2.7.

2.2.3. Cognition and Participation

With first behaviorist and later cognitive perspectives dominating the field of education in much of the 20th century, sociogenetic and sociocultural perspectives were revived in the 1970s and developed during the 1990s. As these perspectives gained ground, they came to represent a paradigm shift much the same way cognitivist perspectives represented a paradigm shift from behaviorism. In other words, while there are historical roots to account for a sociocultural perspective it is even more important to note that the current theoretical framework was chiseled out in debates and even clashes with proponents of competing perspectives. (Table 2.1 later in this chapter outlines some of the paradigmatic differences).

Without going into detail, it is necessary to point to the debates that helped define a sociocultural perspective. In the journal, The Educational Researcher, some well-known proponents of cognitive science (Anderson, Reder, & Simon, 1996) focused on and criticized the ideas put forth by Lave and Wenger (1991) and others promoting situated learning. Criticism centered on situated learning's "overstated claims", particularly the ideas that learning is contextually determined to the effect that it cannot be successfully transferred to other tasks and how participation in interactive, social processes are basic processes in learning. The ensuing debate (Anderson, Reder, & Simon, 1997; Greeno, 1997; Sfard, 1998) clarified positions to the extent that one might talk about different paradigms. Also, two metaphors of learning have emerged with *acquisition* encapsulating the cognitive perspective and *participation* summing up the sociocultural perspective.

But the current sociocultural perspective is far from monolithic. Valsiner and van der Veer (2000:389) distinguish three directions "by way of some gross approximation":

- Dialogical perspectives, emphasizing tensions, conflicts, and negotiation as productive in developing human understanding
- Socially situated activity with its emphasis on social embeddedness of human understanding (including Activity Theory, cf Chapter 2.2.5 below)
- Symbolic construction by human minds as the locus for the social being of the person

The first direction will be discussed in connection with the concept of appropriation (cf Chapter 2.3.5). The third issue will not be treated explicitly, although it is present in discourse analysis, while the second direction of situatedness and activity systems is highly relevant for the present study and needs to be elaborated. In particular, the construct *communities of practice* (cf Chapter 5.8) is a central one with analytical and explanatory power, but also unresolved tensions, for the field of didactics.

2.2.4. Cognitive and situated perspectives

A seminal work on situated learning is the article *Cognition and Learning* where authors James G. Greeno, Allan M. Collins, and Lauren B. Resnick (1996) "review research accomplishments that have influenced the character of educational practice significantly.". In the course of the article, the authors consider three general views of knowing and learning

referred to as *empiricist*, *rationalist* and *pragmatist-sociohistoric*. The first term is attributed to behaviorist models, the second to cognitive traditions of Descartes and Piaget[24], while the third is typified by Dewey and Mead on the pragmatist side and Vygotsky on the sociohistoric side with the added situated aspects from Lave and Wenger. These three perspectives are contrasted throughout the article in terms of issues of theoretical conceptualization and issues of practical conceptualization before the authors conclude with a discussion on how the three perspectives might be mutually exclusive or complementary. Without going into all the detail in the article, an overview of positions, broken down to thematic issues can be illustrated in the following way (Table 2.1)[25]:

[24] In his book on Vygotsky and pedagogy Harry Daniels (Daniels, 2001:37-39) refers to views that might ease the otherwise contrary opposition that historically has characterized the Piaget – Vygotsky debate.
[25] Thanks to Christian Holmboe for the idea of the table.

Table 2.1 Three perspectives on learning
An overview of theoretical and practical conceptualizations

ISSUES OF THEORETICAL CONCEPTUALIZATION

	Behaviorist/ Empiricist	Cognitive/ Rationalist	Situative/Pragmatist - Sociohistoric
Views of knowing	• Accumulated associations • Stimulus/Response - knowledge as an assembly of specific responses • Transfer of learned behaviors	• Mental representations, schemata • Symbolic information processing • Constructive process of conceptual growth	• Distributed among people and their environments • Participation in communities of practice • Attuning to affordances and constraints of settings
Views of learning and transfer	• Instrumental conditioning, absorption of information • Reinforcement • Transfer dependent on similarity of situation	• Intellectual activity • Procedural knowledge for problem solving • Generalizing from schemata, abstracting	• Strengthening of opportunities • Cognitive apprenticeship • Transformations that relate to both learning and transfer situation
Views of motivation and engagement	• Extrinsic • Matching expectation and outcome • Positive reinforcement	• Intrinsic interest in knowledge domain • Meaningful tasks • Insights in self	• Genuine involvement • Establishing and developing identity • Being central to community

ISSUES OF PRACTICAL CONCEPTUALIZATION

	Behaviorist/ Empiricist	Cognitive/ Rationalist	Situative/Pragmatist - Sociohistoric
Designing learning environments	• Routines for effective transfer	• Interactive environments for problem solving	• Rich variety of social and material resources
Formulating curricula	• From components to composite skills	• Sequences of conceptual development towards generality	• Realistic disciplinary practices of discourse and representation
Constructing assessments	• Assessment of knowledge components	• Performance oriented and differentiated	• Assessing participation in inquiry and social practices, involving learners

At the risk of severe reductionism, Table 2.1 makes available contrasts and overlaps between three perspectives on learning. The article by Greeno et al. sums up positions and paves the way for much of the subsequent discussion centering on knowledge, learning, and teaching from either a cognitive or a situative perspective[26]. The article initiated a debate in the journal *Educational Researcher* where Greeno's situated perspective was challenged and discussed from psychological as well as educational perspectives (Anderson et al., 1996; Anderson et al., 1997; Cobb & Bowers, 1999; Greeno, 1997; Kirshner & Whitson, 1998). Questions raised included acquisition of skills versus participation in social practices, generality versus situatedness of learning, transfer[27] of knowledge between tasks versus transfer between situations, the value of abstract, general versus concrete, specific knowledge, and the cognitive notion of breaking down complex knowledge into manageable units versus the situated holistic and ecological approach. Anderson et al. seem to regard a situated perspective as lacking in abstraction and (thus) analytical power, while Greeno seems to find that abstractions do not capture the relations between actors, settings and tools found in the particular situation. This debate further clarified positions and issues referred to in Table 2.1. However, it is interesting to note that while Anderson et al. were uncompromising as to a possible amalgamation of perspectives, Greeno aired the idea of paradigms being complementary. In the case of behaviorist, cognitive, and situated perspectives one possibility is to see the three as analyzing learning at different levels of aggregation; individual response, mentalistic processing and participation in activity systems. Another, and one which Greeno et al. seem to embrace is presented as follows:

> *Another possibility, involving a somewhat more competitive relation among the perspectives, is that the situated perspective can provide a kind of synthesis of the behaviorist and cognitive perspectives. According to this possibility, behaviorist analyses study processes of activity, neglecting their contents, while cognitive analyses study contents of activity, including processes that transform those contents, but neglect processes that must be included if activity is to be understood as being affected by and affecting systems other than individual agents. According to this view, the three perspectives may constitute a kind of Hegelian cycle of thesis – antithesis – synthesis (…) the situative view may develop as a synthesis that unifies the strengths of the two earlier approaches. This view supports an expectation of theoretical developments that will show how principles of individual behavior and of information processing can be understood as special cases of more general principles of interactive learning (Greeno et al., 1996:40).*

Near the end of the same article, Greeno et al. turn to issues of teaching and, implicitly, questions of didactics:

> *The behaviorist perspective suggests a focus on efficiency of conveying information and training skill, and emphasizes teaching practices that involve well-organized routines of classroom activity, with clear plans and goals. The cognitive perspective suggests focusing on teaching as a kind of coaching, emphasizing teachers' understanding of and attention to students' thinking in order to identify potential improvement that they can guide and encourage. The situative perspective suggests a focus on teachers as mentors who represent*

[26] The general presentation of sociocultural and situated perspectives stops here. Later development and the many aspects of sociocultural theory including issues and constructs found to be most relevant will be treated where they pertain to the research questions of the present study.

[27] As noted by Putnam and Borko (Putnam & Borko, 1999:12) a common misinterpretation of the situative perspective is to regard it as an argument against transfer and that context provides all that is necessary. Rather, it is a redefinition of transfer; it not seen as decontextualized but as "an attempt to recast the relationship between what people know and the settings in which they know – between the knower and the known". This is an epistemological dimension that will be pursued in Chapter 2.2.7 below.

communities of practice in the society. As such, they engage in the professional activities of creating and using disciplinary knowledge, exemplify valued practices of these communities, and guide students as they become increasingly competent practitioners (op.cit.:40).

This brief passage holds in embryonic form the outline of a sociocultural didactics that will be pursued in Chapter 3.9 as well as in the empirical analyses and discussions of this study. With its emphasis on settings, environments, and practices the Situative/Pragmatist-Sociohistoric perspective of Greeno et al. seems particularly well suited to accommodating research that investigates how technologies become part of learning environments and how they are woven into didactic practices.

It is beyond the scope of the present work to discuss the possible fusion, imperialism, or non-compatibility of the three perspectives[28]. The sociocultural perspective will in the present work be treated as a distinct perspective and sought to develop the field of subject didactics without claiming to subsume behaviorist and cognitive perspectives. The history of the sociogenesis of mind suggests that the sociocultural perspective can, and perhaps should, be treated as a separate paradigm since it arises from fundamentally different assumptions about human conduct, cognition included.

However, the situative perspective is not the only one within a sociocultural framework; Activity Theory has also made a great impact on studies of ICTs mediating learning and activities, often with a view to institutional affordances and constraints and, thus, should be briefly presented.

2.2.5. Activity Theory

Teacher knowledge is not just situated; it is also mediated (cf Chapter 2.3.2). Artifacts encapsulate old and trigger new insights resulting in new activities. This dynamism is not just intrapersonal, but an interplay between human, tool, goal, and context. Such interplay is basically at the heart of an activity system. It is the latter element, *context*, that has been developed from Vygotsky's object-oriented activity mediated by artifacts, and thus bridges the space between the individual and the social, humans and their environments (Engeström & Miettinen, 1999). However, in the Vygotskian tradition, context is not something that surrounds, but rather something that weaves together (Cole, 1996:135-137).

In Activity Theory, expanding involvement, social and intellectual, is central to learning. In Figure 2.1 (below) an activity system is illustrated. The top triangle is an approximation of Vygotsky's mediated action. In the expanded model of activity theory, this action rests on a foundation of rules, a community of practice, and a division of labor. One component may be in tension with another or mediate the transformation of another component. For instance, networked ICTs may be in tension with a traditional teacher/learner division of labor (delivery and transfer) but also mediate the transformation of such division into a more interactive, collaborative and empowered situation for learners.

[28] In the May 2000 issue of the Educational Researcher, Anderson et al. together with Greeno " (Anderson, Greeno, Reder, & Simon, 2000:13) summarized consensus on several issues and promoted a more inclusive and unified view of human activity.

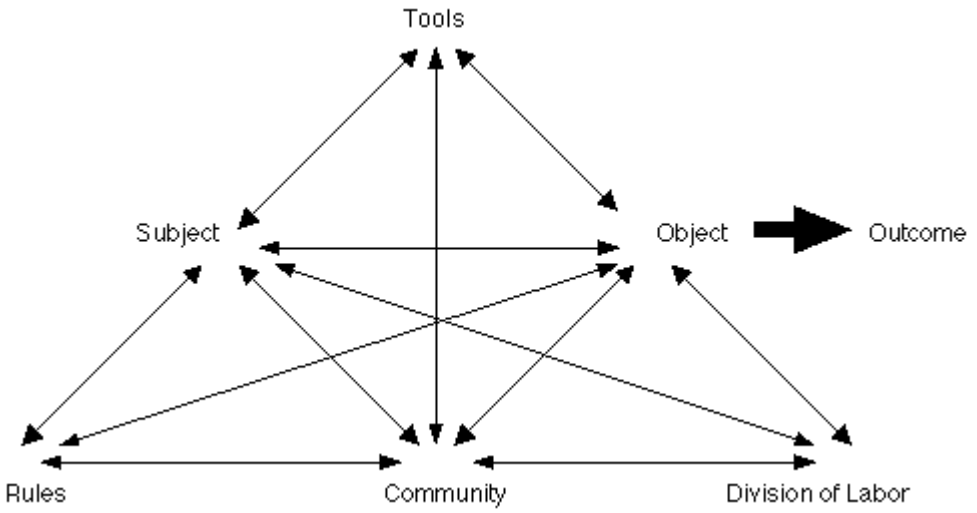

Figure 2.1 A model of an activity system (Engeström, 1999)

In a situative perspective, a *community of practice* (cf Chapter 5.8) has often been used as the unit of analysis. In activity theory, the unit of analysis – *the activity system* - is broader and acknowledges tensions and contradictions between elements in the model. Hence, such systems might be said to be multivoiced and polycontextual. What is more, such tensions are seen as a driving force of change and development from one activity system to another. In addition, activity systems may be in conflict or tension with other activity systems or may be nested in enveloping systems. Consequently, it is important to acknowledge the existence of a myriad of activity systems that through their tensions and contradictions, their dialectical relationships, serve to transform existing systems or bring about new systems. For instance, the impact of ICTs on an existing (educational) activity system might create contradictions that in turn serve to trigger innovative (but perhaps painful) attempts to transform the system. In the analysis of teachers' practices (cf Chapter 6.5), references to them being in between several systems are made. Activity Theory seems a suitable lens for analyzing how teachers find themselves in between systems with different goals and is in the present study used to analyze the macro-conditions (socio-political) under which teachers are expected to practice in ICT-rich environments[29].

2.2.6. Metaphor

The foundations of a perspective are often crystallized in a pregnant image or metaphor. As an encapsulated expression of practical wisdom as well as scientific theory, metaphors become important when spreading an idea and bringing a perspective across the boundaries between the scientific community and 'lay people'. They carry fundamental assumptions as well as bridge different conceptual items. As discussed in Chapter 4.4, metaphors can also guide an investigation and become tools in a *methodological* approach to a research question.

Hence it is only natural that the cognitive and situative perspectives on learning have given rise to two central metaphors that encapsulate theoretical positioning. Anna Sfard puts it like this: "Indeed, metaphors are the most primitive, most elusive, and yet amazingly informative objects of analysis." (Sfard, 1998:4). She goes on to discuss in detail the two metaphors for learning that dominate the field of educational research, often seen as competing, sometimes

[29] It should be noted that the present study does not exploit the full potential found in activity theory. However, it is used as an analytical tool to capture institutional and policy levels, thus adding to the multi-level analytical approach (cf Chapter 4.7.1).

as complementary; the *acquisition metaphor* and the *participation metaphor*. Sfard outlines the characteristics of both metaphors, how they relate to ontological and epistemological issues, before encouraging a theoretical unification with a place for both. They are seen as compatible but incommensurable as they represent two different but complementary perspectives. Without repeating Sfard's most readable remarks, a note on the two metaphors pertaining to (foreign) language learning is in place.

Acquisition

The acquisition metaphor has been so dominant within language learning and teaching that it forms a natural pair in the phrase *language acquisition* and even acronyms such as SLA – *second language acquisition*. Numerous books carry the acquisition title in their titles[30], scholarly journals carry the metaphor (*Studies in Second Language Acquisition*), and the term is probably so well-established that one rarely thinks of it in terms of a metaphor with a particular perspective; it has in many ways become synonymous with the way languages are learned (Donato, 2000:41). This may be a reason why tensions and misunderstandings among linguists are reported when the two metaphors have been debated (op.cit.:48-9).

The notion of acquisition may bring forth ideas of something to be absorbed, to get hold of and possess. The object of acquisition, e.g. the foreign language, is thought to be accumulated in units, thus for people to gain ownership of the product in a step-by-step process. Examples of titles underline this approach: *Accounting for adult acquisition of relative clauses*, *The Acquisition and Use of Spanish and English as First and Second Languages*, *Models, processes, principles and strategies: second language acquisition inside and outside of the classroom* to name but a few[31]. "In SLA such an approach allows us to see language as a set of rules and facts to be acquired" (Pavlenko & Lantolf, 2000:156). Thus, it is closely associated with transfer and ownership whether the overall approach is communicative or structural. Acquisition differs from learning in the sense that it conceives of the learner as more active and constructive and that it emphasizes internalization, not just surface mastery. "Thus, we can summarize that AM [= acquisition metaphor] focuses on the individual mind and the internalization of knowledge" (op.cit.:156).

Participation

Sfard sees the participation metaphor as replacing the commodity stamp of 'knowledge' with the activity stamp of 'knowing': "This seemingly minor linguistic modification marks a remarkable foundational shift (…). The talk about states has been replaced with attention to activities" (Sfard, 1998:6). Another key characteristic is how activities are never separated from the social contexts in which they take place. Hence, accumulation gives way to "a process of becoming a member of a certain community. This entails, above all, the ability to communicate in the language of this community and act according to its particular norms" (op.cit.:6). The participation metaphor denies objectification of knowledge and offers social interaction as a way to construct meanings that are shared with and compatible to those of others. It bridges cognition and social context. Exactly *how* "contextualization and engagement with others" (Pavlenko & Lantolf, 2000:156) might happen and become apparent is a question of didactics that will be pursued in the empirical chapters of the present study.

[30] A comprehensive Second Language Acquisition Bibliography is found online at <http://privatewww.essex.ac.uk/~vcook/slabib.html>. A search for titles including *acquisition* results in more than one thousand entries. A similar search for *participation* results in a handful (as of July 2002).

[31] All titles from the Second Language Acquisition Bibliography, found online at <http://privatewww.essex.ac.uk/~vcook/slabib.html>.

The participation metaphor holds notions of becoming, transforming, border crossing and similar qualities that suggest changes in identity and formation of self. Such qualities suggest a social constructionism with its controversial issues of cognitive relativism. There is a need to delimit the perspective in the present study from such a view. On the other hand, there is also a need for 'conceptual hygiene' and to emphasize the distinctness of sociocultural perspectives at the expense of 'unificationist' views (cf Greeno and Sfard above) of cognitive and sociocultural foundations. While acquisition and participation have been approached as metaphors, they take on characteristics of sustained and contrasting theoretical constructs when we examine their fundamental assumptions. Consequently, philosophical premises of ontology and epistemology will be discussed briefly.

2.2.7. Ontology and Epistemology

From the above outline of the emergence of sociocultural perspectives it becomes clear that questions of ontology and epistemology become crucial since these are underlying, fundamental assumptions for any perspective that claims to be distinct and, hence, to approximate paradigmatic status. In the case of a sociocultural perspective such assumptions are essential for understanding key constructs as well as assessing the validation of a study conducted under the auspices of a particular theoretical perspective. In addition, there is not a lot of work done on such issues[32], making it sometimes difficult to see what is theoretically at stake and (therefore) resulting in misunderstandings as to what sociocultural perspectives essentially entail. Finally, if – as is often claimed – it is time to reconfigure education, its conceptual foundations must be addressed if we want to move beyond cosmetics only. Brown, Collins, and Duguid (1989:13), writing on the epistemology of situated cognition, make the connection between epistemology and classroom practices through a broad claim: "… much common educational practice is the victim of an inadequate epistemology. A new epistemology might hold the key to a dramatic improvement in learning and a completely new perspective on education". What they say is that contexts contribute to the concepts people form; concepts are not abstract and transferable between settings like e.g. authentic practices and classrooms. Knowledge and not just learning is situated and embedded in the world, and distributed among people and artifacts. This is an epistemological claim. However, in order to find out just what such an epistemology entails, we have to look further and not only at epistemology but at ontology as well.

According to Martin J. Packer and Jessie Goicoechea,

> *Epistemology is the systematic consideration, in philosophy and elsewhere, of knowing: when knowledge is valid, what counts as truth, and so on. Ontology is the consideration of being: what is, what exists, what it means for something – or somebody – to be (Packer & Goicoechea, 2000:227).*

Typical *ontological* questions would be whether social reality is external, imposing itself on individuals, or merely the result of individual cognition (Cohen & Manion, 1994:6). Typical *epistemological* questions would be "How do human beings – how *can* they - come to know anything about the world?", and "What, if anything do they (can they) know *for certain* either one at a time, as individuals, or collectively, for example as members of a profession?" (Toulmin, 1999:53, emphasis in original). Epistemology, according to Toulmin, has been in

[32] There is, of course, ample work on ontology and epistemology *per se*, but mostly from a psychological perspective focusing on how learning takes place. An epistemological perspective applied to a traditional *didactic* viewpoint of assigning some status or value to what is learnt, how it is learnt, and for what reason is not that common.

deep crisis all through the 20th century. The reasons are chiefly found in the futile efforts to determine knowledge as the possession of individuals, partly as the interiority of mental activity, "mental lives (…) trapped within our brains" (Toulmin, 1999:57). Toulmin argues that epistemological philosophy seems to suffer from a claustrophobic framework, and "the whole epistemological agenda now needs to be reformulated" (op.cit.:54).

One example of such a historically significant ontological but currently contested position is the dualism of Descartes in which mind and body are separated; the mental and material represent two different categories, independent of each other. It follows that (individual) mind can exist without matter (*cogito ergo sum*). This is in direct opposition to a sociocultural ontology, which is, in essence, nondualist and refers to the mind as existing as a social entity (cf the sociogenetic roots in Chapter 2.2.2): "Briefly, a theory of social practice emphasizes the relational interdependency of agent and world, activity, meaning, cognition, learning, and knowing" (Lave & Wenger, 1991:50).

Packer and Goicoechea identify six key themes in the roots of sociocultural theory that have an ontological bearing:

> *(a) the person is constructed, (b) in a social context, (c) formed through practical activity, (d) and formed in relationships of desire and recognition, (e) that can split the person, and (f) motivating the search for identity (Packer & Goicoechea, 2000:228).*

Again, the transformation of human identity is central, learning in this perspective is not so much about knowledge construction but as 'coming to be' through social practices, "we must continually remake ourselves, and in doing so we make society and history" (op.cit:231). This, in turn, makes learning an integrated aspect of ontology, not just epistemology[33]. What is more, ontology and identity are not static entities, but in flux. Learning implies change in self, context and meaning, "Individuals operate not with schemata and procedures (as cognitive science models human behavior), but through attunements to constraints and affordances" (op.cit.:230). This is an "ontology of the person" (Packer, 2001:494): what schools do and what becomes of a person who attends school are two aspects of the same ontological concern. Learning is thus not only related to knowledge but to knowing, i.e. "that school changes the kind of person a child becomes" (op.cit.:511). *Transformation* becomes a socioculturally ontological metaphor.

At this point, cognitive and constructivist ontology part with a sociocultural one. Mind as culturally and historically made, the transformation of the individual through social practices, the dialectical relations between humans and their environment are ontological assumptions in a sociocultural perspective. "Learning entails both personal and social transformation – in short, ontological change" (Packer & Goicoechea, 2000:235). In contrast, constructivists keep the dualism between the internal and the external. "What constructivists call learning is only part of a larger process of human change and transformation, the process called learning by socioculturalists" (op.cit.:238).

[33] A literary example may serve to illustrate the point. In the opening scenes of *Hard Times* (1854), Charles Dickens introduces the identity-ontological issue by showing how Sissy Jupe's intimate and 'lived' experience with horses constitutes the person, her 'self'. This, however, is negated in a school setting with its demand for abstract 'facts' and where she is even deprived of her name (Lund, 2001). The first chapter of the book can be found online at <http://eserver.org/fiction/hard-times.html>

If persons are transformed and not just their knowledge of the world, what, then, is the role of the distinct school subject? How does it relate to the 'real world variant' of the same knowledge domain? Bridget Somekh addresses such issues when she writes:

> *(…) a sociocultural analysis of knowing and coming-to-know must include interaction with the knowledge and understanding of our sociocultural heritage. Shakespeare, for example, must live for our children, but we need an education system that enables them to engage with his work actively, through performance, rather than as de-contextualised text-to-be-struggled-with, without any purpose or desire to understand it. To this, Saljo [sic] (1999) adds the 'psychological tools' (…) language, writing, spelling (…) concepts, definitions and procedures (…) (Somekh, 2001:167).*

Such issues will be pursued in Chapter 3.9.5 on didactics, school subject and 'reality'. For now, suffice to say that a sociocultural perspective acknowledges a material world, e.g. in the form of Somekh's Shakespeare heritage (above). This is a material world that exists and is not constructed (in a radical constructivist or postmodernist[34] way) but the meaning we attach to it is, and meaning is constructed through language. This is no less true for a second or foreign language. Seen in the perspective of identity formation, it means that a learner's *lifeworld*, "the world valid as existing for us", (Cope & Kalantzis, 2000a:206, citing Husserl)[35] becomes the focal point instead of e.g. curriculum and syllabus. In this also lies a potential for dismantling the dichotomy of in-school and out-of-school learning. For EFL, this is a particularly relevant perspective (Lund, 2001).

To summarize so far, a sociocultural ontology is process-oriented, "where people shape the social world, and in so doing are themselves transformed" (Packer & Goicoechea, 2000:234), hence "process is not only a guiding orientation, but is the fundamental nature of reality" (Sawyer, 2002:12). It also views the individual as inseparable from collective and context, underlining the distributed nature of learning over persons and their environments. This latter aspect will be pursued in Chapter 2.3.4 below.

However, ontological and epistemological assumptions also change as the impact of digital and networked technologies continue to grow. In *The Challenge of Digital Epistemologies*, Colin Lankshear (2002:1) shows how technologies change our conception of "what it is to know things" and touches upon the consequences this will have for schools. These changes are identified along four dimensions:

Firstly, "Changes in 'the world (objects, phenomena) to be known' associated with the impact of digitization" (op.cit.:2). This is an ontological dimension. For instance, well developed translation software and a handheld device can (to some extent) turn people into multilingual performers without them actually *knowing* more than their L1[36].

[34] Terms such as postmodern, postmodernism and postmodernist are notoriously vague and ambiguous. It is not possible to clarify all the philosophical issues involved. When such terms are used in the present study, they are understood as promoting a view that social and cultural realities, as well as social science itself, are human constructions.

[35] The key construct of *lifeworld* is used throughout the present study in the Husserl sense.

[36] This possibility is exploited in a commercial from one of the major cell phone companies: A young Norwegian boy lost in an Arabic country (it seems) is able to rejoin his parents since a local officer spots his Norwegian flag, tunes his cell phone to translate from Norwegian to Arabic, exchanges cell phones with the boy, and is then able to understand the boy describing the situation.

Secondly, "Changes in conceptions of knowledge and processes of 'coming to know'" (op.cit.:3). This is an epistemological dimension. In digital networks and distributed, 'virtual' worlds relations between the knower and what might be known are different than in nature. Whether they are called cybercultures, virtual worlds, or artificial communities, the point is to bring visions into realities we can trust or doubt, adjust to or manipulate. For language learning, chatterbots or simply BOTs[37] also illustrate this point. They can be engaged in conversations, taught, manipulated and trained for certain tasks so that they take on qualities of human agency. The more sophisticated kinds challenge us to do a 'Turing test'[38].

Thirdly, "Changes in the constitution of 'knowers' which reflect the impact of digitization" (Lankshear, 2002:7). This change addresses the move from individual expertise towards distributed cognition, communities of practice, and networked collaborations, "a collective assemblage involving many minds and machines" (op.cit.:7). This aspect poses a direct challenge to school practices where knowledge is still very much a matter of private accumulation from textbook material and is assessed as such.

Finally, Lankshear points to "Changes in the relative significance of, and balance among different kinds and modes of knowing" (op.cit.:8). Propositional knowledge, representing theoretical and empirical basis for professional practice gives way to procedural knowledge and new forms of interpersonal understandings.

These aspects, and related issues, are further discussed in another article by Lankshear, Peters and Knobel (2002). To the authors, the Internet is neither just an accumulation of content nor a new communication channel but "a range of technologically mediated spaces of communicative practice"(op.cit.:18) that adds a dimension of spatiality to the ontology described above; the *where* dimension becomes essential in networked practices[39].

Lankshear et al. identify epistemological change in five points that capture textual, spatial, and procedural aspects. The authors group them around a "standard view of knowledge which has dominated Western thought since Plato" (op.cit.:31) and a *procedural* epistemology. Table 2.2 (below) is an adaptation of Lankshear's model; categories are kept but partly nutshelled and partly re-worded in order to emphasize some of the sociocultural aspects discussed above.

[37] See e.g. <http://home.online.no/~anlun/bots.htm>

[38] Alan Turing (1912-54) designed a test situation where a human and a computer would be interrogated without the interrogator knowing which was which. If the interrogator could not tell man from machine, the machine would be said to be intelligent and pass the test.

[39] The impact of wireless handheld devices makes this aspect especially relevant (Rochelle & Pea, 2002).

Table 2.2 Characteristics of standard and procedural epistemologies

Standard Epistemology	Procedural Epistemology
Linearity: knowledge is carried linguistically and expressed in sentences/propositions and theories	**Multimodality**: ICTs challenge linearity, meaning emerges in spatial as well as textual mode
Stability: knowing as carrying out acts that pertain to some "truth" that is taken to exist	**Flux**: knowing as ability to perform in communities of practice
Individual cognition as manifestation of expertise	**Collective** assemblage involving minds, artifacts and contexts
Value of knowledge determined by **use**	**Value** of knowledge determined by **exchange**, knowledge becomes commodified
Belief in value or "truth" of information **precedes** the use of it	Information is acted on, **belief** in "truth" or value may **follow**

The two latter points will not be elaborated here, but are interesting from socioeconomic and philosophical perspectives. The three first items, however, show how ICTs add to and reinforce dynamic and dialectic aspects of a sociocultural epistemology. Also, the three first items in the description of procedural epistemology serves as a foundation of the kind of literacy – multiliteracies (cf Chapter 3.8) – that is needed in order to make sense of the changing and exponentially growing abundance of information.

This ends a look into some issues of ontology and epistemology. The present study argues that it is important for two reasons. One is that such issues are troublesome and fuzzy but still they contain fundamental assumptions that color a theoretical perspective. Therefore, they must be clarified and pursued for 'hygienic' reasons. The other reason is that they do hold implications for teachers. In a digital and networked world they will need to develop literacies that make them take on questions related to procedural knowledge, learning as transformation, and knowing as being distributed over humans and artifacts. This is a daunting and perhaps even unattainable goal if activities that embrace such notions are not made visible and analyzed.

While this discussion of epistemology and ontology so far has tried to make clear distinctions towards dualist and empiricist perspectives, it also needs to address one of the more inflamed issues in qualitative research, namely that of relativism, before turning to constructs that help operationalize the underlying assumptions of a sociocultural perspective.

2.2.8. Relativism

Relativism is an important issues because it has implication for how we come to perceive the world and what status such a perception has. School subjects provide a shared view of the world and they provide opportunities for enculturation into such a shared view. However, one view is never static or indefinitely true; it will always be challenged by another. For instance, the present study argues that what counts as English and EFL, and what it means to be proficient in this school subject, is changing (cf Chapter 3.3).

In an introductory chapter on social research, Margaret Wetherell et al. (2001) first outline two traditions of research. The first tradition, often associated with natural science, includes

positivism and post-positivism. Knowledge obtained through this research tradition is assumed to be value-free, generalizable and, thus, universal – what is generally referred to as 'true'. The contrasting perspective (embracing e.g. poststructuralism, postmodernism, and critical theory) rests on three tenets:

- The social world is so complex that it cannot be confidently predicted, hence research focuses on meanings and significance
- All observations, 'data', reflect viewpoints of the people who study or are studied.
- "no single truth is possible because reality is neither single nor regular: there are multiple realities and therefore multiple truths" (op.cit.:12)

The third assumption signals a relativist position. Such a relativist view has ontological status. The question is whether, or to what extent, it meets with sociocultural ontology as described in the preceding subchapter.

Relativism is a particularly messy topic and has spawned often uncompromising and heated argument[40]. Also, there are several types (cultural, ethical, linguistic/conceptual) and degrees (absolute, radical, moderate, local/temporal). At the risk of excluding relevant aspects, this short section will only consider relativist notions as they pertain to a sociocultural perspective on learning and teaching, and – briefly – linguistic relativity.

In a sociocultural perspective, mind is not seen as a mirror of nature. Actors are shaped by as well as shaping contexts and relations. To some this might evoke images of relativism. However, as Valsiner and van der Veer affirm (2000:43), "this does not mean that some objective event did not take place, (…) but that our understanding and recollection of it is framed as a narrative, a story that has functions both for the social other and ourselves". In other words, we have a shared history, and this history is very much real. How we (re-) construct it is a matter of cultural activity. History, then is material in ontological terms, but epistemologically relative since the relations between the knower and the known vary and cannot be framed and expressed in one single, universal understanding. Nevertheless, a shared history and the emphasis on collective and interpersonal understandings do not accommodate 'pure' relativism. *Historicity* is an anti-relativist, although not deterministic, notion in sociocultural theory. It sets a sociocultural perspective apart from a postmodernist or (radical) constructivist one. The latter allows for individual subjectivity and focuses on how a narrative is constructed and used for certain undertakings[41].

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[40] A particularly infamous example is Alan D. Sokal's parody on postmodernism which, with its unintelligible jargon and general mumbo-jumbo was accepted as a scholarly article in *Social Text*, No 46/47, 1996. Sokal exposed the hoax in *Lingua Franca*, No 6, 1996.

[41] A discussion on constructionism and ontology is beyond the scope of this study. However, a footnote might suggest the scope: In a survey article on constructivism D.C. Phillips (1995) groups three main epistemological variants according to how far removed they are from the 17th century philosopher John Locke's empiricist views of the mind as passively receiving impressions from nature; man is a *tabula rasa*, on which to imprint new ideas. At the opposite end of this epistemological scale is radical constructivism (Phillips attributes this variant to von Glasersfeld) with its individual knowledge structure, cognitive inclination, and "scant attention to the social processes in knowledge construction" (op.cit.:8). In between are positions where collective, sociopolitical processes alone account for learning, and a position that combines active individual participation with a realization of the social nature of learning. A similar grouping is made by Robert McCormick and Peter Scrimshaw, but with slightly different (and perhaps more fitting) categories where the (third) sociocultural perspective is more distinct:

> *(…) those who take a 'radical constructivist' view of learning (von Glasersfeld, 1955) see students as constructing an individual knowledge structure that is tested (for its validity) against its viability in making sense of the individual's world. Such an approach sees the objectivity of knowledge as an untenable concept. Those who take a mainstream cognitive constructivist view, on the other hand, see*

Roger Säljö expresses the same line of reasoning. After discussing how language makes us perceive the world from a certain perspective, he rejects the notion of ontological relativism and that any account of the world is as valid or interesting as any other:

> *On the contrary. In a sociocultural perspective it is evident that human thinking develops from attempts at mastering the natural and social environment. But our knowledge about the world is not found in objects or incidents alone, but in our discourses on these and in artifacts. In the same way our discourses – knowledge systems – and artifacts are not arbitrary or exchangeable. They have been developed over a long time and represent experience and insights of mankind (Säljö, 2000:234, my translation).*

Alvesson and Sköldberg (1994:51-62) discuss the objectivism/relativism dichotomy, concluding that the incommensurability of the two positions can be approached via 'critical pluralism' in which we acknowledge our ability to enter the horizons of others, thereby enriching our own. This entails that "one must critically make various demands on theory, constructs, empirical results etc and acknowledge that such demands are always founded on an in-built position" (op.cit.:60). This seems to be compatible with a sociocultural perspective that acknowledges history as 'real'.

While history is retrospective, the *shared goal* can be seen as its future counterpart. In education, this materializes in artifacts such as policy documents, curricula and syllabi. These are externalized, material manifestations of collective thinking, of shared ambitions and purposes. This is but one example of what could be said to constitute an *objectifying* feature in sociocultural perspectives. With its emphasis on the externalization of mental processes, *mediation* of such processes becomes essential to understanding them. Hence, the cultural tool, the *artifact* (cf Chapter 2.3.3), becomes a key construct in sociocultural theory. Artifacts can be tangible (e.g. ICTs) or symbolic sign systems (language), but they provide a shared point of reference for human activity. The artifact, like history, is a collective focal point that transcends the individual, constructed view and connects people in their meaning-making efforts. Stephanie Taylor sums up the position quoting Martyn Hammersley's term 'subtle realism': "This accepts that we cannot have neutral certain knowledge of the reality of the world but suggests that we can have knowledge with the status of 'beliefs about whose validity we are reasonably confident' (Taylor, 2001a:325).

The present sub-chapter can be summarized in a few statements:

- Relativism carries implications for how we come to see a school subject
- Sociocultural perspectives reject the notion of ontological relativism. A material reality is assumed to exist and act as a condition for our perceptions of the world
- This does not mean that reality is a static entity. There is fluidity and development in the process of being
- History, shared goals and artifacts serve as regulatory mechanisms that do not accommodate ontological relativism

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> *knowledge as in the head, and matching reality outside the head; i.e. there is a form of objectivity. Those who emphasize the social dimension of learning, and hence knowledge, focus on the shared creation of knowledge (at the interpersonal or community level) and consider subjective (or intersubjective) views of knowledge. From a situated perspective, therefore, objectivity of knowledge is rejected (McCormick & Scrimshaw, 2001:42).*

But what about language? In the wake of discussions on relativism the issue of linguistic relativity has gained renewed interest and needs to be briefly presented.

2.2.9. Linguistic relativity[42]

Relativism is not treated in the above section only because of its relevance for theoretical underpinnings. It is also relevant for a view of language, which again has consequences for a view of foreign language didactics. In a sociocultural view, language is a mental tool for participating in cultural practices. But when we use language, we use it with a double perspective; the *meaning* of a word, phrase or utterance is sustained collectively, as a culturally determined semantic unit (as e.g. defined in a dictionary), while the individual, local *sense* we bring to it, is infused with what it stirs up in our consciousness. Vygotsky (1986:244-45) sees this distinction between meaning and sense as the difference between a "stable and precise zone" and "zones of unequal stability". When we try to linguistically capture a phenomenon we approach it with several possible configurations of words and speech acts, both meaning and sense, and they will color the way the phenomenon 'comes to life' through speech or writing. This is a relativist position, since no two people will infuse language with exactly the same *sense*: "sociocultural approaches to SLA are closely related to social constructivism in interpreting foreign and second language interaction to involve the *creation*, and not mere reflection of social realities" (Thorne, 2000b:230, emphasis in original). With networked ICTs mediating cultural and linguistic contact at increasing speed and volume such issues become even more pressing.

Relations between language, thought, and culture were getting more attention at the turn of the last century (see also Chapter 3.5). The approach represents an alternative to e.g. universal and generative views of rule-based language being individually and mentally (and largely unconsciously) processed (Chomsky, 1975, 1980, 1986). It necessitates more attention to context and relations in language acquisition than "the code model of communication (…) that (…) places emphasis on the formal characterizations of language involving the linguistic competence (in Chomsky's sense) to produce grammatical utterances" (Thorne, 2000b:228).

The essence of linguistic relativity is "the idea that culture, through language, affects the way we think, especially perhaps our classification of the experienced world"[43] (Gumpertz & Levinson, 1996b:1). Language is seen as a constitutive component in the social processes involved. In their seminal edited volume, *Rethinking linguistic relativity* by John J. Gumpertz and Stephen C. Levinson (1996b), the authors identify such processes through four themes adding up to a line of argument. Firstly, different languages 'code' identical aspects of the world using different lexicogrammatical features, and this influences the speaker's conceptualization of that aspect. Secondly, to what extent 'universals' are present across

[42] "The original idea, variously attributed to Humboldt, Boas, Sapir, Whorf, is that the semantic structures of different languages might be fundamentally incommensurable, with consequences for the way in which speakers of different languages think and act" (Gumpertz & Levinson, 1996a:2). This is, indeed, a vast, complex, and controversial topic. The present subchapter only touches the surface of the topic and does not, for example, discuss the Sapir-Whorf hypothesis *per se*, its possible interpretations (hypothesis or doctrine), its strong and weak versions etc. Nor does it discuss to what extent structural, morphological, or lexical features of a particular language affect our conceptualization of the world (Humboldt's *Weltanschauung*). See e.g. Dan Slobin's short article *Language and Thought* (1998) for illustrations. Topical to the present study, however, is the way linguistic relativity pertains to contexts, situatedness, and identity-forming in language learning and, implicitly, its consequences for didactics.

[43] For a study of how conceptual categories do not mirror real-world categories (objectivist view), see e.g. George Lakoff's book with the instigating title, *Women, Fire and Dangerous Things: What Categories Reveal about the Mind*" (1987).

different languages is debatable, but research suggests that meaning does not reside in lexicon and grammar alone. Thirdly, contextual factors are needed and can be decisive in the meaning-making process. Language use in context becomes the focal point; subtleties of shared values and local practices become essential for interpreting and communicating. Finally, this adds up to a view where meaning is considered to exist in situated, social practices and a reconsideration of linguistic relativity:

> *From an "inner circle" of links between grammar, categories, and culture as internalized by the individual, the focus shifts to include an "outer circle" of communication and its relation on the one hand to interaction in social settings and on the other hand to individual patterns of cognition which are partly contextually attuned, and even perhaps acquired primarily through patterns of communication, in turn enabling it" (Gumpertz & Levinson, 1996b:9-10).*

And the authors conclude on a note that is highly relevant for EFL learners who, increasingly, are socialized in 'out-of-school Englishes' (Lund, 2001, cf. Chapter 3.3 on 'Englishes'):

> *If meaning resides in interpretive practices, and these are located in the networks one is socialized in, then the "culture-" and "language-" bearing units are not nations, ethnic groups or the like – they are not units at all, but rather networks of interacting individuals, which can be thought of in more or less inclusive ways"(Gumpertz & Levinson, 1996a:11).*

With specific reference to SLA, Stephen Thorne argues for a theory of language learning that acknowledges linguistic relativity. But instead of adopting the view attributed to (the strong version of) the Sapir-Whorf hypothesis with its linguistic determinism (our conception of the world is at the mercy of the language we use), language is seen as *one of several components* that influence the way we interpret the world: "language is the medium through which historical, discursive, and cultural resonances lend to particular contexts their texture and working principles" (Thorne, 2000b:231), and, "In essence, social agents constitute themselves in part through the language practices they engage in" (op.cit.:235). What follows from this observation, is a view of language learning as making choices from a vast range of lexicogrammatical items according to how they relate to the situation at hand.

The implications bring up the notion of ontology as being understood in terms of transformation, including one's self, identity. Moreover, this is not a relativism that makes humans prisoners of a linguistic code but rather sees them as agents creating diverse representations of the environment. Humans approach a phenomenon with a certain perspective when they articulate representations of the phenomenon. These representations are found in Vygotskian *meaning* and *sense* as well as in register and, not least, in diverse languages. It adds up to a truly complex relationship with the world in which we contextualize it according to the semiotic budget we command and the practices they are embedded in.

Looking at foreign language learning and teaching, the implication is that the learner's sense of language might not correspond to the meaning as found e.g. in a textbook or the classroom discourse. If learning a language is not just acquisition but socialization, being transformed through using it (cf Chapter 3.5.2) to stick to the ontological claim, a relativist view of language means that available options become essential. And, as the next chapter argues, these options are multiplying with English language variants being mediated by networked and digital technologies.

In sum, a view of language as inextricably bound to historical and cultural practices, expands the focus from language as a lexicogrammatical system to that of conventions established

through negotiation, social setting, institutions, ideology, and other contextual features. That does not mean that a particular language determines a particular outlook on the world (which would make foreign language learning extremely taxing!). On the other hand, context is not (reduced to) a variable that can be isolated in research on language learning. Agent, language and context is regarded as mutually constituent factors.

This concludes the presentation of the fundamental principles of a sociocultural perspective. The next section will turn to some of the key constructs that frame this perspective, and relate them to the empirical sections of the present study.

2.3. Key constructs

2.3.1. Culture

> *In short, because what we call mind works through artifacts it cannot be unconditionally bounded by the head nor even by the body, but must be seen as distributed in the artifacts which are woven together and which weave together individual human actions in concert with and as a part of the permeable, changing, events of life*
>
> *Michael Cole and James V. Wertsch (1994:3).*

The above quote effectively captures key constructs in sociocultural theory. They add up to a view of culture as a medium within which humans interact with their environment by the help of tools that carry on historically accumulated achievements of man and, at the same time, have the potential to transform and improve processes that lead to such achievements. Roger Säljö describes it this way (2000: 29, my translation, emphasis in original): "As a common noun for all these resources that are partly found with the individual, partly in social interaction, and partly in the material surroundings, one can employ the concept of *culture*". This, of course, is different from a view of culture as a fixed variable or as a sum of certain features. Instead, culture is determined in terms of communities of discourse. As in the sections on ontology and epistemology, the procedural aspects are distinct and perhaps most explicitly stated by Ed Hutchins (1995:354): "Culture is not any collection of things, whether tangible or abstract. Rather, it is a process. It is a human cognitive process that takes place both inside and outside the minds of people. It is the process in which our everyday cultural processes are enacted".

This brief introduction to a sociocultural understanding of culture serves as a bridge to cultural mediation.

2.3.2. Mediation

Perhaps the most essential notion in sociocultural theory is that of the mind being mediated: "…this is the unifying and connecting lifeline throughout the works of Vygotsky, Leont'ev, Luria, and the other important representatives of the Soviet cultural-historical school" (Engeström, 1999:28-9). A central tenet for Vygotsky is that we do not act directly upon the world but indirectly, by means of mnemonic, symbolic and material techniques developed by others. As human competencies and techniques are woven into tools, these tools can mediate cognitive efforts and transcend the Cartesian separation between individual mind and the surrounding world.

But when we make use of these tools, it is not only for acting upon the environment but for connecting with other people as well. When we make use of mediating tools, they are not

'neutral', just serving certain predefined processes. Such a view would e.g. be typical of applying ICTs to existing practices in a purely instrumental fashion, neglecting the potential for transformation of practices. Rather, tool mediation introduces new procedures and functions, make others redundant, hence transforming practices. For Vygotsky, this transformation was applied to basic or 'lower' psychological functions and processes turning into 'higher' functions through the use of a means or a medium (Valsiner & van der Veer, 2000:364-75). Simple mnemonic techniques (e.g. non-verbal memory like the knot on the handkerchief) are developed and transformed through culturally produced tools like language, symbols, arithmetic operations, binary systems etc. However, to Vygotsky the primary tool – or 'tool of tools' as he referred to it – was language, "a 'human invention' that is used as a means of achieving the goals of social living" (Wells, 1999:6).

James Wertsch (1998:44) uses a more tangible example in referring to the pole in pole vaulting: the pole is nothing on its own, only through a human agent does it become a culturally produced tool that extends and transforms man's ability to negotiate barriers of a certain kind. In fact, the development of the tool (fiber glass) so transformed the athletic discipline that "disputes arose as to whether the same action was indeed being carried out". The example illustrates how tool development and human agent interact in producing more sophisticated action through dialectic interplay; it is not *either* the tool or the agent transforming practices, but the interplay between the two that creates an affordance. The fiber glass pole would be inefficient if used with traditional pole vaulting techniques developed for different pole material (wood, aluminum). The human agent must change in order to exploit its potential. Thus, mediation applies across dimensions from little materiality (spoken language) to substantial materiality (pole vaulting, electronic word processing) embracing mental as well as physical aspects of actions. In other words, mediation is found in semiotic systems as well as in activities and artifacts.

A parallel is found in the way languages and language use are transformed when mediated by ICTs (Crystal, 2001a, 2001b, 2001c; Wark, 1997; Warschauer, 2002). Handwriting and typewriting have in common a linear, sequential approach to writing. The same approach applied to word processing and writing for the World Wide Web would be inefficient. Just like the pole jumper, the writer must change her conceptual understanding, attitude to and technique of writing in order to exploit the potential, and in the process transform the way she writes. With word processing and hypertext, writing is as much design as process; cutting, pasting, moving bits around, linking items, making extensions available as options, integrating graphics, and facilitating co-writing. Only when the human agent, the writer approaches word processing and the WWW with a conceptual understanding of the potential does the word processor become a cultural artifact that extends our notion of writing, i.e. *mediating* it.

Writing with technology is treated in detail in Michael Heim's *Electric Language. A philosophical Study of Word Processing* (1987), perhaps the first study to address the digitization of language[44]. As the book is not written within a sociocultural framework, the notion of mediation is not explicated. Nevertheless it illustrates how the tool-mediated action involved in the writing process is transformed when ICTs (word processing software,

[44] It should be noted that Heim draws on two earlier shifts in the representation of language. The first is the change from spoken to written mode, the second brought about by the printing press. Together with the shift brought about by ICTs these landmarks exemplify the sociocultural interplay between historical change, cultural tools and human activity, although Heim treats his theory of transformation from a perspective closer to symbolic interactionism.

spellcheckers, and computer) infuse the process. In fact, ICTs might be said to change the ontological status of written language:

> *Electronic words have strange properties that make them seem halfway between physical and mental. They can be revised and rearranged easily and endlessly; they never wear out. They can be reduced to paper at any time, but don't need to be, ever. They can be shipped near-instantaneously around the world, and copied exactly as often as you choose (op.cit.:ix).*

Heim carefully tracks the consequences of this shift through observing how language takes on spatial and graphical qualities at the computer's interface, how writing strategies change with permanent revision available, how reading and writing and publishing merge, how writing becomes a collective and public as well as a private notion, and how the connection between thought, language, and reality change under "a panorama of man-made images and symbols far more complex than can be assimilated directly through the senses and thought processes" (op.cit.:47). To Heim, ICTs are transformative technologies, but he rejects the limited and rather instrumental notion of them changing communicative practices of information storage and exchange alone[45]. Instead, he places the transformational potential within "an altogether different psychic framework for human thought" and "finite historical worlds" (op.cit.:69). In sociocultural terms, this points to how our thinking and social conventions are mediated and transformed – not determined - by culturally and historically affordances and constraints: "Thought must now learn to live in a new element if it is to live at all" (op.cit.:224).

As the concept of 'text' changes with digital technology and becomes experienced as 'data', its mediating powers increase. The networked text[46], distributed over nodes and with its multimodal forms of expression, connects with a rapidly increasing amount of stored information and with a rapidly increasing number of online readers and writers. These mediational qualities are, of course, found at the core of the hypertext as the *link* (cf Chapter 4.4.3 for a discussion of the link as part of the interface). Embedded in technologies with increased processing power, wireless solutions and diminutive size, mediation might enter into symbiotic relations with humans, as a transparent aspect of our everyday lives (Kurzweil, 1999). To an increasing extent, life becomes mediated, demanding a type of *literacy* (cf Chapter 3.8) that has mediation as one of its principal characteristics. For education, the mediational aspects of learning might prove to become one of the key issues.

Roger Säljö (2000:100, my translation) summarizes the present status of mediation in the following way: "We think by means of and via intellectual and physical tools and new ones are created all the time in modern society". And if not new, they may change in status; Daniels (Daniels, 2001) for instance, argues that institutional levels and discourses of education are central means of mediation within schooling and that they extend the traditional learner – teacher interaction often found as the analytic focus in didactics.

Mediation is itself nothing like a fixed procedure, but always in transition. It constantly provides shifting connections between the internal and the external aspects of human life,

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[45] For instance, Heim is critical of Marshall McLuhan's inclination to view modern media as *the* crucial factor in bringing about societal change. In his book "Digital McLuhan: A Guide to the Information Millennium" Paul Levinson (Levinson, 1999) seems to echo some of this romantic determinism, although he also acknowledges the transformational and dialectic aspects involved: "This new digital emphasis not only on knowing but in knowing how to know – which suggests that the most fundamental form of knowing is doing – is consistent with the educational philosophy of John Dewey (…)" (op.cit.:196).

[46] It is interesting to note that the word *text* comes from the Greek word 'weaving' as it appears in 'textile' (Russel, 2002:68), cf con*text* as that which weaves together.

alternately by sometimes finding and appropriating, sometimes by creating and developing meaning. These processes are very much embedded in the potential of the cultural tool, the artifact, and are crucial when analyzing how teachers and learners make use of ICTs in the classroom (and beyond).

2.3.3. Artifacts

Mediation is not possible without the *artifact*. An artifact is the mediational means that convey, shape, and transform mental processes, such as learning, for specific purposes or with a certain rationale. It "has been modified by human beings as a means of regulating their interactions with the world and each other" (Cole, 1999:90). It follows that artifacts are not devoid of social content but, on the contrary, infused with it. Artifacts are not only contemporary; they carry a history of humans developing cultural tools adapted to particular situations: "Because tools and the way they are used reflect the particular accumulated insights of communities, it is not possible to use a tool appropriately without understanding the community or culture in which it is used" (Brown et al., 1989:3). As such, they take part in producing as well as reproducing and transforming the human condition. When such tools are inherited, they become appropriated and undergo adjustments according to new demands.

Like Heim observes, ICTs regarded as artifacts introduce new functions to writing like e.g. spell checking, outlining and integrating graphics and thesauri etc. Writing as a set of operations (cf the many possibilities listed in the previous sub-chapter on mediation) is made visible. What is more, ICTs have the potential to re-structure and recreate the whole process of writing, from planning the next sentence and paragraph to continually revising through exploring and 'sculpting' with language. As Michael Heim has shown, we have to re-conceptualize the notion of writing since digital artifacts do not just facilitate or emphasize practices but fundamentally change them. Artifacts have prosthetic qualities - we think *with* them - but they are not just external aids to mental processes. Rather, they are woven into such processes according to the cultural, historical, and institutional context (Cole & Wertsch, 1994). With such powerful artifacts writers have greater opportunities to position themselves in texts and the relation between writer, context and artifacts could become the focus of the writing classroom: The potential of "reconceptualizing writing as a social practice offers tantalizing glimpses of the potential role it can serve in second language learning" (Vollmer, 2002:2). The present study argues that such glimpses can be found in the networked writings described in Chapter 6.4.5.

This view means that artifacts are seen as accumulating human knowledge, competencies and cognition. The watch and the calendar embody our socioculturally developed concept of time, the pocket calculator accumulates a long history of numerical competency, the genre of the business letter has built-in conventions from the world of commerce, myths and legends mediate historically situated insights, understandings, ethical norms etc. New conventions arise from the use of email, chat groups, and web pages. In sum, physical artifacts may be seen as materialized instances of thinking that can function as resources within certain social practices, while other intellectual artifacts are constituted by discourses (Säljö, 2000:234). For example, the discourse of the EFL classroom is quite different from the discourse represented by that of 19th century Norwegian sailors, the online chat session or other powerful (mostly) out-of-school contexts. The discourse of a structural approach to language learning is different from e.g. immersion approaches.

According to Gerry Stahl, "The task of education (…) is to revive meanings that have been captured and preserved in artifacts" (Stahl, 2002:6). In the EFL classroom, a number of

powerful artifacts are employed. They range from linguistic tools to analog (chalk, blackboard) and digital tools, from in-school and out-of-school discourses, adding up to the new cognitive artifact of the foreign language. But this artifact is also a historical-cultural tool with its preserved conventions and traces left by generations of speakers. Basically, in the ICT-enriched EFL classroom we have a situation where artifacts are mediating the appropriation of a new artifact: language and technology together mediate new variants of language. The (foreign) language is the means as well as the goal, but in both cases it emerges within a range of genres, settings, and situations that demands new literacies as well as knowledge about appropriation processes. The complexity becomes even greater when we see how teachers and learners interact around these artifacts. Both learners and teachers appropriate technological and linguistic artifacts, but appropriation takes on forms and directions that challenge the learn/teach and learner/teacher dichotomies along with the notion of the classroom as the 'place to learn'. With more research into such classroom practices, we may be able to identify *acts* that will serve as artifacts for teacher trainees as well as practicing teachers (and learners) (Rochelle & Pea, 2002).

In order to gain a better understanding of such acts, it is important to acknowledge the dual nature of artifacts; their *genotype* and *phenotype* qualities (Thorne, 2000a)[47]. The *genotype* represents the material quality that artifacts have. These qualities will, in turn, influence the activity into which they are introduced. For instance, when learners make use of an online, distributed environment to discuss relationships (cf Chapter 6.4.5) the artifacts involved transform the communicative activity into a many-to-many mode. This affordance is 'coded' into the technological artifact; it equals a blueprint for this particular communicative opportunity. The *phenotype*, on the other hand, refers to how participants make use of the artifact in according to their previous histories with ICTs and communicative activities. Their lifeworlds, purposes and goals, influence the observable use of the artifact. In other words, people's *cultures-of-use* (Thorne, 2002a) influence the way artifacts are appropriated (also illustrated in Chapter 6.4.5).

Consequently, different discourses may envelop the artifacts; teachers may see them as educational enhancement while young learners may see them as exploratory or entertaining tools. Teachers may see word processors as fostering process-oriented writing; learners may see opportunities for graphic illustrations and creative use of fonts and colors etc. Thus, we see different scripts for ICTs according to who is using them.

There is a sociogenetic aspect to the genotype – phenotype relationship. The individual use of an artifact is a surface phenomenon that needs to be related to the 'deep structure' of the genotype. In the genotype of the artifact we find the socially and culturally developed and stored blueprint for the activity. Also, the phenotype manifestations can be individual as well as institutional (and even national, e.g. in the form of ICT policies). Analyses of how artifacts are conceptualized by different (groups of) users may prove to increase our understanding of how technologies are (or are not) integrated in the classroom. Harry Daniels (Daniels, 2001:83) also points to how current research has begun to "examine issues such as the conditions that have given rise to cultural tools, and the constraints as well as the affordances associated with them", thus adding a broader perspective to this most central sociocultural construct of artifacts.

[47] Originally lifted form the field of biology, the genotype – phenotype relationship can be said to equal that of the relationship between genetically coded and inherited information in a living organism and its outward, physical manifestation including behavior.

2.3.4. Distribution

The sociogenetic roots of mind point towards the notion of cognition being a collective as well as an individual endeavor. Cognition is 'stretched over' or distributed among people in interplay. As mediating artifacts are seen as being constitutive of learning, it goes without saying that they, too, have distributed qualities.

With the advent of networked ICTs we have developed digital artifacts that mediate learning processes in ways that are not restricted to place and time and that link minds and resources. In many ways, such technologies can be said to help accomplish processes of learning and teaching that are central to a sociocultural perspective. Although earlier types of mass media have pointed in this direction, ICTs have come to epitomize learning in distributed environments, thus accommodating the theoretical perspective that relocates learning from individual mind to relations with others and interactions with artifacts[48]. The topic of distribution will be pursued in Chapter 3.6 on ICTs in learning and teaching, where it is related to the field of didactics and classroom practices.

Through constructs such as culture as discourse community, mediated action, artifacts, and the distributed nature of learning, sociocultural perspectives offer a conceptual framework for understanding how ICTs infuse and potentially transform educational practices. Such transformation amounts to a realignment of participants, artifacts and subject matter. What is lacking so far is an approach to and an understanding of how artifacts are encountered by teachers and learners, how they are employed or rejected, under what conditions they support traditional practices or transform them. For this purpose the construct of *appropriation* captures the complex processes of possessing cultural tools. In the present study, appropriation is a most crucial construct and will therefore be discussed in some detail in the following sub-chapter.

2.3.5. Appropriation

The concept of appropriation is attributed to the Russian linguist and critic Michael Bakhtin (1895 – 1975)[49]. In the passage below, Bakhtin ties appropriation to the use of language, how it is always found in the midst of social interaction, borrowing from others and projecting intensions at the same time:

> *As a living, socio-ideological concrete thing, as heteroglot opinion, language, for the individual consciousness, lies on the borderline between oneself and the other. The word in language is half someone else's. It becomes "one's own" only when the speaker populates it with his intention, with his own accent, when he appropriates the word, adapting it to his own semantic and expressive intention. Prior to this moment of appropriation the word does not exist in a neutral and impersonal language (it is not, after all, out of a dictionary that the speaker gets his words!), but rather it exists in other people's mouths, in other people's contexts, serving other people's intentions: it is from there that one must take the word, and make it one's own.(…) Language is not a neutral medium that passes freely and easily into the*

[48] A more radical variant of distributed and networked perspectives is actor-network theory (ANT) which does not distinguish between human and nonhuman agents, - they are all *actants*. Hence, networks become autonomous and self-sufficient and human cognition seems to play a modest role, if any at all. See e.g. Bruno Latour's chapter six *A Collective of Humans and Nonhumans* (1999). A sociocultural perspective will place more emphasis on how individuals engage in and shape social practices in networked environments, like co-participants

[49] Without being overtly explicit, Vygotsky touches upon the notion of appropriation in *Thought and Language*. For instance, he points to how the child receives the meaning of a word in conversations with adults and "from the speech of others" (1986:122). He goes on to elaborate that this involves "an acquisition of new concepts and words that will be woven into the existing texture of the child's concepts" (op.cit.:152).

> *private property of the speaker's intentions; it is populated – overpopulated – with the intentions of others. Expropriating it, forcing it to submit to one's own intentions and accents, is a difficult and complicated process (Bakhtin, 2000:293-294)*[50].

At the heart of appropriation is, as demonstrated by the above quote, transformation and dialogism. Such processes require creative participation from those involved in the appropriation process like e.g. selection, emphasis, and interpretation. Whenever we engage in interaction with people and artifacts, we appropriate insights, knowledge, and skills. But since they, like Bakhtin's *word*, may be half alien, we need to inhabit them with our intentions. Insights, knowledge, and skills become transformed according to our needs and purposes. Consequently, appropriation is a process that takes place within a person's zone of proximal development (cf Chapter 2.3.6 below). When this does not happen, resources offered by other people and artifacts remain uncultivated and 'alien' [51].

These characteristics show how the notion of appropriation is so well suited to a sociocultural perspective on mediated human conduct and cognitive processes. In the present study, appropriation is used as a key concept when analyzing and discussing what has so far been called 'teachers' encounters with ICTs', but which should be understood as different dimensions of the appropriation processes involved. Roger Säljö's definition captures the essence of this view:

> *Appropriation means that one acquires an intellectual tool or learns to master a particular material tool in order to employ it for certain purposes and in certain situations. Appropriation of concepts or skills is not necessarily something completed. The boundary between comprehension and non-comprehension is often not very clear. Also, complex concepts or skills cannot be appropriated in one way only (Säljö, 2000:152, my translation).*

It is interesting to note Säljö's emphasis on functionality as well as non-comprehension. Appropriation is not necessarily a conscious effort, as observed by Morgan, Russell, and Ryan:

> *Of course, we teachers do not always consciously intend such transformations or appropriations of ICTs to our pedagogical purposes; nor can we always anticipate and plan for all the possible outcomes of any shifts in practice. Our learning may be retrospective, occurring after the event as we trace what happened, or it may be ongoing, immediately responsive to unpredictable contingencies resulting from the entanglement of literacies, technologies and forms of learning (Morgan, Russell, & Ryan, 2002:51).*

As such, appropriation is different from the somewhat problematic Vygotskian notion of internalization[52]. While internalization is often associated with schema theory, acquisition of knowledge and skills, appropriation is closely linked to developing identity, of becoming, so that we understand ourselves better, differently or simply begin to understand ourselves (Nielsen, 1995:9). Lave and Wenger (1991:101:) put it this way: "Thus, understanding the technology of practice is more than learning to use tools; it is a way to connect with the history of the practice and to participate more directly in its cultural life". In sum,

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[50] Whether Bakhtin's meaning translates correctly across linguistic codes is open to debate. Valsiner and van der Veer's version (Valsiner & van der Veer, 2000:410) of the first part of the same quote differs on several points, but is careful in providing the original Russian words and terms as well. This underlines the situatedness of the language. On a different tangent, the present researcher encourages readers to substitute linguistically related terms with technological ones in the quoted passage, e.g. language = technology, word = ICT etc.

[51] Bakhtin's use of terms are invested with his sometimes idiosyncratic content. Thus 'alien' does not necessarily signal estrangement but rather the opposite of what is one's own, to be experienced by an outsider. Consequently 'alienation' is in many ways a presupposition for dialogue (Bakhtin, 2000, glossary p. 423).

[52] The term 'internalization' may seem to convey a dualism between the external and the internal and also a view that when something is internalized, we can look for the mental entities that are the results of them. See e.g. Roger Säljö (2000:106) and James Wertsch (1998:48) for a discussion.

appropriation is a non-dualist, social and cultural construct; internalization subordinate social and cultural aspects to cognitive processes.

James V. Wertsch (1998) writes extensively on Bakhtin's notion of appropriation and how tensions arise in the appropriation processes. There might be friction as well as resistance when people are in positions where they appropriate mediating tools. Another important issue is the relationship Wertsch sees between *appropriation* and *mastery*. The two are intertwined, but the latter is problematic with its overtones of internalization and instrumentalism. As mastery and appropriation are so crucial to understanding teachers and learners working with ICTs, and since these concepts have been further explored by other researchers (see Grossman, below), a somewhat extensive quote is in place:

> *Returning to the issue of how mastery and appropriation are related, it is worth noting that in many instances higher levels of mastery are positively correlated with appropriation. However, this need not be the case. Indeed, some very interesting forms of mediated action are characterized by the mastery, but not by the appropriation of, a cultural tool. In such instances of mediated action, the agent may use a cultural tool but does so with a feeling of conflict or resistance. When such conflict or resistance grows sufficiently strong, an agent may refuse to use the cultural tool altogether. In such instances, we might say that agents do not view that cultural tool as belonging to them.* If agents are still required to use this mediational means, their performance is often characterized by clear form of resistance such as dissimulation.
>
> *(…)*
>
> *… appropriation of mediational means need not be related to their mastery in any simple way. In some cases, mastery and appropriation are correlated at high or low levels, but in others the use of cultural tools is characterized by a high level of mastery and a low level of appropriation (Wertsch, 1998:56-7, emphasis added).*

Wertsch's triangle of appropriation, mastery, and resistance is interesting in view of teachers encountering ICTs. Mastery would equal instrumental expertise but not necessarily as a result of any intrinsic conceptual or cultural motivation. The result is (sometimes tacit) resistance, a recurring concern in many programs of technology integration in schools[53]. Martin Owen (1999:4), for instance, discusses appropriation of and resistance to technology in education and observes that "Cultural-historical theory suggests that tools, including cognitive artifacts, are created at a particular moment in the historical trajectory of a culture" and that this moment may be milieu-specific and alien to education. Consequently, "Ubiquity in the application of ICT is only realistic in education and training if there is a genuine appropriation of ICT by education itself" (op.cit.:10). This distinction between mastery and appropriation is important when approaching programs for the educational integration of ICTs.

One attempt at analyzing and developing the construct of appropriation with a view to teachers and teaching is made by Grossman et al. (1999). In their article, *Appropriating Tools for Teaching English: A Theoretical Framework for Research on Learning to Teach*, the authors propose activity theory a useful framework for studying teachers' professional development. Their article, building on Wertsch's discussion of appropriation, does not refer to ICTs specifically, but the way it emphasizes social and cultural factors when appropriating "pedagogical tools" makes it relevant for the present study. Also, it is interesting to see how Bakhtin's originally linguistically oriented construct has been extended to a more general educational domain. One passage especially relevant for ICTs is quoted below:

[53] Note that although appropriation is here discussed with relevance to ICTs, there is also the case of teachers appropriating EFL, the official educational discourse etc. In short, appropriation permeates all efforts of coming to terms with something that originates outside ourselves.

> *Appropriation refers to the process through which a person adopts the pedagogical tools available for use in particular social environments (e.g. schools, pre-service programs) and through this process internalizes ways of thinking endemic to specific cultural practices (e.g. using phonics to teach reading). Wertsch stresses the ways in which appropriation is a developmental process that comes about through socially formulated, goal-directed, and tool-mediated actions" (op.cit.:15).*

And the relevance to technology-rich learning environments becomes even more evident in the following questions:

> *From an activity perspective, then, the central questions about learning to teach include these: How do activity settings mediate teachers' thinking? What kinds of social structures are prevalent in different settings, and in what manner do they mediate the appropriation of particular pedagogical tools for teaching? To what extent are different tools for teaching appropriated for use in different settings?* (op.cit.:15).

Grossman et al. go on to define five 'levels' of appropriation that reflect degrees of in-depth understanding. In the following, the five levels are kept. However, in the article by Grossman et al., one can get the impression that these levels are consecutive stages to be reached. As this section on appropriation has tried to show, the concept of appropriation does not involve a linear process of gradually achieving higher levels of mastery. Appropriation is a construct that does not accommodate stages of development; rather, it consists of a cluster of various relations to an artifact, as active and dynamic social and communicative processes. Consequently, the categories listed below should be regarded as dimensions, a repertoire of comprehension and application connected with the artifact (Säljö, 2000:119, 152).

The present study makes use of appropriation dimensions described by Grossman et al. However, they are somewhat modified and somewhat elaborated so as to capture the more EFL- and ICT-specific issues involved in the present study:

- **Failed Appropriation.** This assumes an attempt (not necessarily premeditated or deliberate) on the part of the agent, but resulting in lack of appropriation. Regarding ICTs, such a lack of appropriation might be explained by the complexity or instability of the technology, its incompatibility with the teacher's framework (curriculum, policies, teaching schedules) for teaching and learning a language, cultural mismatch between teacher and learning environment etc. Constraints dominate affordances, thereby reducing technology's functional potential for the user. Still, despite failed appropriation, the teacher may have instrumental skills.
- **Nominal Appropriation.** Regarding ICTs, this would suggest awareness of different types, appropriating a 'label', but without any understanding of features that might prove conducive to language learning. For instance, taking 'pedagogical software' at face value or not realizing the often idiosyncratic and sometimes plain faulty results of using spell and style checkers would exemplify nominal appropriation. In the case of EFL, a teacher expressing affinity to a communicative approach while practicing a structural, drill-and-practice variant would amount to the same. On a larger scale, nominal appropriation might be illustrated by the 'hype' that accompanies sales-promotion of technologies. This would explain the phenomenon of computers being 'oversold and underused' in education (Cuban, 2001).
- **Instrumental Appropriation**. Regarding ICTs, this would suggest various degrees of instrumental skills and a surface understanding of the (socially constructed) authoritative version of the concept. Such authoritative views would e.g. be found in national plans, particular in-service programs etc. The sum of the skills and the surface understanding do not add up to the conceptual whole of the tool, e.g. what word

processing or the Internet means beyond facilitating certain mundane chores. There is no acknowledgment of the transformational potential in ICTs or of the potential for cultural renewal. Instrumental appropriation is often found at the heart of technology-driven projects and programs. In *The Tower* course it was an important but not primary dimension.

- **Conceptual Appropriation**. Teachers who grasp the conceptual underpinnings of ICTs would have the potential to use the tools in innovative ways and/or in new contexts. Such teachers might design integration programs, ICT-rich environments, and situations conducive to learning where technologies are integrated in disciplinary, cross-disciplinary and social relations. However, grasping conceptual underpinnings does not necessarily materialize in full, instrumental appropriation of the tool. With its link between technologies and learner-centered application, *The Tower* course provided opportunities for conceptual appropriation. As teachers were exposed to a series of opportunities, they reflected on and formed beliefs about ICTs but there were no guarantee that this dimension of appropriation materialized in sustained, innovative practices.
- **Cultural Appropriation.** In the article by Grossman et al. (1999:18) this dimension is considered to be on a level of *mastery* - "the skill to use a tool effectively … this more fully realized grasp would take years of practice to achieve". However, in the term *Cultural Appropriation* that is suggested here, the emphasis is on the synergy of conceptual and instrumental appropriation. At the heart of this dimension we find culture, within which humans interact with their environment and by the help of tools (see Chapter 2.3.1) is. Teachers who manage to culturally appropriate ICTs may not only adapt to and engage in current practices and discourses, a process of enculturation, but transform and transcend these as well so that knowledge construction can be developed. There are important elements of agency and empowerment. In this lies an important future aspect of renewal and innovation, of what *might be*. In the case of EFL it means that teachers would know how ICTs might infuse and change social practices (like learning a language through participation in diverse practices) and design environments and activities that are conducive to such practices. It involves teaching beyond the curriculum (cf Table 7.1 in Chapter 7.3 and Chapter 7.6.1).

Such a cluster of appropriation dimensions might help generate insights in teachers' use of technology and hypotheses on how best to promote fruitful exploitation as well as future-oriented practices. In the present study, conceptual and cultural dimensions are pursued through analyses of *The Tower* course and classroom practices respectively while remaining dimensions are played down.

However, it must be emphasized that appropriation processes are interwoven in the social contexts they take place. How important this is, is sought illustrated in Chapter 6. In addition, the above dimensions of appropriation are embedded in the larger cultural-historical activity system of the educational setting, for instance in the culture of a school or an educational policy. This means that the transformation that is at the heart of appropriation opens up real possibilities for change in a culture. With a view to this, collective and institutional appropriation might emerge as one of the more intriguing areas of educational research. However, while analyzing appropriation in light of the totality of the activity system might seem imperative, it is clearly beyond the scope of this study.

The present sub-chapter has established appropriation as a key construct when analyzing teachers practicing in ICT-rich environments. Of course, appropriation will also apply to

learners and others who try to make a cultural tool work according to their own intentions. However, the construct also involves degrees of latitude as afforded and constrained by developmental zones, i.e. what is possible in light of available resources. Consequently, the Vygotskian notion of ZPD needs to be pursued as it carries implications for the individual teacher and learners as well as the various constellations they form.

2.3.6. The Zone of Proximal Development (ZPD)

When learning and teaching are considered basically a social and collective endeavor, constructs that capture such characteristics can be useful in order to encapsulate important processes and make them accessible. A particularly important example is Vygotsky's construct of the zone of proximal development (ZPD):

> *It is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more intelligent peers (Vygotsky, 1978:86).*

There is no unanimous agreement as to how the ZPD construct should be interpreted. Lave and Wenger (Lave & Wenger, 1991) distinguish between three possible understandings. Firstly, the ZPD is given a *scaffolding*[54] interpretation emphasizing support for learners' performance. In this version, the role of the more capable peer as well as the collaborative negotiation of knowledge is emphasized. Assisted performance may be said to be at the heart of the scaffolding view. Secondly, a *cultural* interpretation is given focusing on "the distance between the cultural knowledge provided by the sociohistoric context – usually made accessible through instruction – and the everyday experience of individuals" (op.cit 76). In this version, emphasis seems to be on bridging the gap between learners' lifeworlds and the larger, cultural contexts of human conduct. Thirdly, with the influence of activity theory the ZPD takes on a more *collectivist* interpretation and is defined by Engeström (in Lave, 1991:48-49) as the "distance between the everyday actions of the individuals and the historically new form of societal activity that can be collectively generated". This version emphasizes processes of social transformation and generation of new practices. In the present study this third, collective and generative interpretation is adopted: the ZPD is regarded as a space where culture and cognition interact.

But researchers also point to how a one-dimensional, 'vertical' interpretation has reduced the ZPD to a mechanistic construct of support. Hoel (1998:120, my translation) suggests an alternative understanding of the construct with "horizontal layers at different levels where different zones interrelate". This is a much more dynamic view of the ZPD and it results in a need to constantly redefine it according to learners' needs, affordances, and constraints. It also means that the ZPD can be viewed as inhabited by an individual as well as a collective who create a common ZPD through their interactions (op.cit.:126). Such a view is shared by Daniels:

> *Multiple and possibly conflicting discourses with different sociocultural historical origins may be in play within the ZPD. This view of the ZPD as the nexus of social, cultural influences takes us far beyond the image of the lone learner with the directive and determining tutor. It*

[54] Closely related to the role of the teacher and the role of instruction is the construct of scaffolding. According to Daniels (2001:106-116), scaffolding has traditionally concentrated on support for learners more than simplifying the task at hand. In a sociocultural perspective, the term has come to imply recruitment of a learner by a more capable peer who estimates the support needed in order to engage the learner in an activity beyond the learner's current understanding or control. Support is gradually withdrawn as the learner is empowered.

> *provides a much expanded view of the 'social' and the possibility of dialectical conception of interaction within the ZPD (Daniels, 2001:67).*

In other words, while the ZPD may still be applied to a dyadic relationship (cf teachers Helen and Marie in Chapter 6.9.6), classrooms with their complex interaction patterns may be said to represent a multiple, multilayered, polyphonic version of the ZPD in which individual learners as well as groups move toward "historically new form of societal activity", to quote Engeström again. For instance, when learners in class 1aac are engaged in online discussions (cf Chapter 6.4.5) the individual learner engages in activities within her own ZPD (assisted through interactions with teacher, peers, technology) while the collective of the class is engaged in a new form of societal activity, i.e. a new communicative practice that requires certain conventions not yet fully established (cf Chapter 3.3.2). In the latter case, multiple influences – including the teacher's – interrelate to extend the collective zone of development. Anne Edwards (2002:3) argues that new forms of societal activity create ZPDs and cites Valsiner's description of the ZPD as "the set of possible next states of an organism's relationship with its environment". It might seem as if communicative activities mediated by ICTs would fit such an interpretation.

In *Thought and Language* there is a detailed account of school instruction and development (Vygotsky, 1986: 171 - 191). After first rejecting instruction and development as mutually independent (a view attributed to Piaget), and then the identification of the two, Vygotsky argues that the two processes are in continuous interaction. However "We found that instruction usually precedes development" (op,cit.:184). This observation is immediately linked to the construct of the zone of proximal development: "What the child can do in cooperation today he can do alone tomorrow. Therefore the only good kind of instruction is that which marches ahead of development and leads it; it must be aimed not so much at the ripe as at the ripening functions" (op.cit.:188). In order to utilize and extend the ZPD, Vygotsky argues that instruction must be directed at the future and what the learner cannot yet do. This important point is also taken up by later scholars in the Vygotskian tradition: "The focus on the 'zone of proximal development' was in Vygotsky's thought similarly calling for the unification of the children's experience of challenges with the teacher's efforts to create them" (Valsiner & van der Veer, 2000:249). In his thorough discussion on Vygotsky and pedagogy, Harry Daniels (2001:55) bluntly states that "Instruction was the driving force of development for Vygotsky". However, it is still fair to argue that Vygotksy did not elaborate in detail on the role of instruction in the ZPD, and that this has given rise to several interpretations of the role of instruction as well as the ZPD itself (Daniels, 2001; Dunn & Lantolf, 1998; Kinginger, 2002; Wells, 1999:318). It is also in the raison d'être of the present study, cf Chapter 1.3.

Before ending this discussion of the ZPD, it is also worth noting how Steven L. Thorne (2002a) gives the construct of the ZPD a normative or prescriptive slant by placing it squarely in the teacher's design for learning. Thorne argues that the ZPD could be used,

> *(…) as a conceptual tool that educators can use to understand students' emerging capacities that are in early stages of maturation. In this way, when used proactively, teachers using the ZPD concept as a diagnostic have the potential to create conditions that may give rise to specific forms of development (Thorne, 2002b:5).*

Making use of the ZPD in this way would give more substance and direction to the role of the teacher as designer (cf Chapter 3.11). For the learners, it means that designs would focus more on their capacity for agency and how this can be articulated within the design. Thorne's

focus on the proactive use of the ZPD is illustrated in the classroom practices in Chapter 6 and in particular the designs of teacher Tom (cf Chapter 6.4). These designs invoke multiple zones of proximal development, including those of the teacher. Daniels (2001:119), building on Brown et al. (1989), sums up the role of the ZPD in a learning community as:

> *(…) a context within which multiple zones of proximal development are in place at the same time. It is envisaged that each learner can pursue different sequences and progress through different routes each at their own pace. Thus the classroom is seen as a setting in which multiple, overlapping zones of proximal development are supported. This support is made available through the system of practices that make up the Community of Learners.*

The bottom line is that the Vygotskian construct of the ZPD encourages and even presupposes teacher intervention and scaffolding. Such intervention is not necessarily in the form of direct, dyadic scaffolding but involves designs in which the learner gradually is empowered through peers and artifacts to engage in "new forms of societal activities" (Daniels, 2001) or a "possible next state"(A. Edwards et al., 2002). In the present study, both teachers and learners are involved in processes of empowerment as their ZPDs overlap in the ICT-rich learning environment. But implicit in instruction, zones, scaffolding etc is also a reduced degree of freedom for the learner (Mercer, 1995:72 - 75). The optimal *degrees* of learner freedom in ZPDs and how teachers can be trained to design for it needs more research. In light of the online classroom practices analyzed in Chapter 6, this is an important concern from a didactic point of view.

Finally, moving from a general view of the ZPD and into a more linguistically oriented perception[55], we also see that the ZPD invokes different, even incompatible, perspectives. First, two apparently similar constructs must be differentiated; Vygotsky's ZPD and Stephen Krashen's formula *i + 1* (Krashen, 1992). The latter, in language learning and teaching a well-established idea, posits that we acquire languages by receiving and processing comprehensible input. However, this input should be slightly beyond our current level of competence (*i*) so that the (*+ 1*) factor represents the next stage in language development. The processing of this input takes place within the learners' internal language acquisition device (LAD).

On the surface, one might see a similarity between (at least some versions of) the ZPD and the *i + 1* formula; "there has developed a perception, at least in some corners of the SLA field, that Krashen's and Vygotsky's constructs are either comparable or complementary" (Dunn & Lantolf, 1998:417). However, despite superficial similarities, the constructs are conceptually and theoretically incompatible. In a review article on the two constructs, Dunn & Lantolf (op.cit) argue that the two are even incommensurable. The authors attribute this to the underlying assumptions of learning and development: Vygotsky's position is regarded as organic, dialectic, and social where meaning-making is crucial; Krashen's position is regarded as separatist in the sense that his view of acquisition is an individual cognitive process in stages. The authors summarize the distinctions:

> *The difference between the two theories under consideration here ultimately resides in the fundamental difference between a hard-science and romantic view of mental behavior. The former, essentially a reductionist approach, theorizes people as autonomous objects*

[55] Although the present thesis does not discuss issues of language acquisition specifically, the school discipline (EFL) is highly relevant to how ICTs come to be viewed and used by teachers. Consequently, it is necessary to clarify how the ZPD has come to be understood in the linguistically oriented community.

comprised of bundles of variables; the latter fundamentally a monistic orientation, theorizes people as unified, self-interpreting cultural agents (op.cit.:428).

With two different theoretical underpinnings, the ZPD construct and the *i + 1* formula become non-translatable, incommensurable. This is an important theoretical issue when trying to apply the ZPD construct to the compound field of language learning, technologies and didactics.

But there are also other concerns when addressing the ZPD in language learning. In a comprehensive article on the ZPD in American foreign language education, Celeste Kinginger (2002) finds three interpretations of the construct. The first is a utilitarian skills-oriented interpretation that dovetails with transfer-oriented approaches. The construct is "reindexed through a process of reduction and simplification such that it can serve to justify extant institutionalized practices and reinforce traditional views of the language classroom as a locus of skill acquisition" (op.cit.:253). The second interpretation emphasizes interactions through scaffolding. Scaffolding implies gradually empowering learners. However, Kinginger finds that this does not necessarily happen. Teachers identify scaffolding with the construction of a ZPD but "they are doing essentially the same kind of activity that have always been done in classrooms where speaking activity takes place as a pretext for grammar practice, only now we are calling it the 'ZPD'" (op.cit.:255). Finally, the ZPD as an arena of collaborative dialogue is suggested. Essential to this interpretation is the view of the ZPD as providing opportunities for interaction. Such opportunities may not even have been anticipated; serendipity may well be the case. The point is that the learner is seen as emerging and unfolding in language practices with others while reflecting on such activities. These collective, complex, and dynamic characteristics resonate with those voiced by Hoel, Daniels, and A. Edwards on the previous pages and which correspond to the view of the ZPD in the present study. What remains to be determined is the role of instruction and the teacher – the more capable peer.

2.3.7. Criticism of sociocultural perspectives

Despite the historical roots briefly noted in this chapter, the sociocultural perspective is a young one. Although there presently is a lot of interest in and a lot of research adopting a sociocultural perspective, its impact on the research community is hard to determine. This brief section will not attempt to justify the sociocultural perspective, this is implied in it being used as a theoretical approach in the present thesis, but will refer to some questions and criticism that require consideration.

Valsiner and van der Veer (2000:416) observe that what seems to emerge is "the basic lack of intellectual breakthroughs, paired with a number of starting points that are not taken to their full potentials by their authors". They exemplify this claim by pointing to the lack of elaboration on and development of ideas such as Bakhtin's polyphony of voices and constructs such as participation and guidance. Still, (as hopefully this study will show through references) there is an increasing number of studies using and developing the constructs above. However, an explicit acknowledgment of the ontological assumption of the mind as social in nature is not that commonly found.

Some socioculturalists have addresses unresolved or badly explained issues. Keith Sawyer (2002) addresses unresolved tensions in sociocultural theory from a philosophical position. According to Sawyer, socioculturalists do not always agree on two fundamental issues; 1. a process ontology claiming that only processes are real and that entities, properties and

structures are not the fundamental categories of being, and 2. a view of the individual and the collective as being inseparable. Without going into the various positions, it should be said that the present study does not advocate the exclusively 'process position' regarding issue 1 (see Chapter 2.2.7 on epistemology and ontology). In mediated action, for instance, artifacts are treated as entities although they obviously are part of a process. As for the second issue, the present study adheres to *inclusive separation*, that is "the sociogenetic claim that individuals and sociocultural setting are separate but interdependent" (op.cit.:15). Still, according to Daniels (2001:34), exactly how social insights become individual and how individual understanding can transfer from one social setting to another is an ongoing debate and "it remains one of the central dilemmas in the development of cultural psychology, sociocultural and activity theory".

Another point to ponder concerns what Sawyer sees as socioculturalists being partial to small-scale observation. Sawyer does not discuss activity theory, but notes that

> *"Thus, we see socioculturalists examining small group interaction, but neglecting to study large-scale patterns of macrosociology – social class, networks of role positions, institutions, long-term social history, or cultural symbol systems. (…) Socioculturalists do not have an adequate theory of social structure and how it constrains and enables individuals" (Sawyer, 2002:24)*

From an activity theory perspective, Sawyer has a point. Situated learning perspectives might be criticized for being too static with regard to social systems and situations. On the other hand activity theory, while often capturing the dynamics of the bigger picture that Sawyer would like to see, is not all that common when analyzing particular classroom practices within a specified subject, although this seems to be changing with the advent of some studies where activity theory is used to analyze e.g. language tasks (Coughlan & Duff, 1994) and writing in L2 (Nelson & Kim, 2001).

A similar concern for small-scale observation is expressed by Fjuk and Ludvigsen (Fjuk & Ludvigsen, 2001). In their case, the concern is for time scales. People using technologies must be studied in real-life situations over extended periods of time. Focus, they argue, has been too narrow, often capturing small-scale interactions and not how educational communities afford and constrain participation. The structural relations between short-span, here-and-now interactions and longitudinal patterns seem to pose a challenge for a sociocultural perspective. Such issues are addressed by Jay Lemke (Lemke, 2000) and are touched upon in Chapter 4.7.1 on multilevel analysis and in Chapter 6.2 on how to capture layers of time in ethnographic research on classrooms.

Finally, the sociocultural perspective has yet to come up with particular methodologies to guide research and operationalize its core concepts. There are elements of a socioculturally inspired methodology in several studies (Bødtker, 1996; Donato, 2000; Lim, 2000; Linehan & McCarthy, 2001; Pavlenko & Lantolf, 2000; Somekh, 2001), and Gordon Wells' book on dialogic inquiry in classroom research (Wells, 1999) is a seminal effort, but there seems at the time of writing to be no overview of or dedicated approach to developing a methodology *per se*.

A related problem is the lack of tangible 'examples of good practice'[56] that exemplify socioculturally-inspired classroom practices. Again, there is an increasing number of studies, but they often lack longitudinal perspectives. Referring to CSCL, Gerry Stahl (2002:2) observes that "Collaborative knowledge building may be a way of life on the leading edge of scientific research, but it has proven devilishly hard to foster in contemporary school classrooms". This gap between research and practice might also illustrate a problem of application within a fairly new educational perspective. The present study might be read as an attempt at minimizing that gap.

To summarize, these observations show that the sociocultural perspective is still young and in need of development. Despite the paradigmatic characteristics sought described in the present chapter, there are several positions and tensions that need to be clarified and pursued, not least with a view to empirical studies where individuals, collectives, artifacts and institutions make up the unit of analysis. Sawyer might conclude somewhat glumly that "the situation is unstable" (2002:24). However, competing views may just as well advance the theoretical framework that has situated and mediated social practice as its unifying feature.

2.4. Conclusion

The present chapter has tried to show how human thinking and learning are mediated social processes. Rather than assuming that learning is about forming abstract concepts to represent reality (often associated with Piaget and constructivism) a sociocultural perspective claims that knowledge cannot be dissociated from the cultural and historical background of the learner and the setting in which it is embedded. The chapter has also argued that this position carries ontological and epistemological implications that ought to be pursued in making the sociocultural perspective more robust and distinct.

Further, key concepts in this perspective have been presented and discussed with a view to how they can describe and explain learning and teaching processes in general and teachers' appropriation of ICTs in particular. Appropriation is seen as a key construct in understanding how ICTs are employed in learning and multiple appropriation processes are located with individual and collective zones of development. At the outset of the present chapter Cohen and Manion (Cohen & Manion, 1994) were quoted as arguing that educational research was at an early stage and therefore mostly descriptive. Hopefully, sociocultural perspectives as presented in this chapter have pointed to possible ways to advance that stage.

Most important, however, is how sociocultural theories seem to offer a perspective on learning and teaching together with a set of constructs that make it possible to approach the transformation of the classroom under the impact of ICTs. By transcending dichotomies of the individual and the social, mind and activity, a sociocultural perspective provides an analytical tool for studying how learners, teachers and artifacts realign themselves and, thus, reconfigure the classroom. Under such circumstances, teachers appropriate technologies as they integrate them in their practices.

This concludes the discussion of the theoretical perspective. However, before going into a methodological discussion of how to study the processes involved in appropriation of and interaction with ICTs, it is necessary to delimit and pin down the field where this theoretical

[56] In a sociocultural perspective, an 'Example of good practice' is, of course not a static entity or fixed ideal. Rather, it is a situated and relational construct that serves to illustrate how learners, teachers and artifacts configure themselves around a complex educational assignment and how such configuration serves to facilitate progressively mature forms of participation in negotiating such an assignment.

perspective will be employed, namely at the juncture where language acquisition in general and EFL in particular meet ICTs and (subject) didactics. This convergence is the topic of Chapter 3 that follows.

3. At the intersection of school subject, technologies, and didactics

> *The language I learn in a classroom is a communal product derived through a jointly constructed process*
>
> *(Breen, 2001:134)*

> *As a professor of TESL/applied linguistics, I am frequently contacted by graduate students wishing to pursue research on CALL but not knowing where to begin*
>
> *(Chapelle, 1999:112)*

> *It is the learning of mature members and of their communities that invites the learning of newcomers. As a consequence, it is as learners we become educators*
>
> *(Wenger, 1998:277)*

3.1. Introduction

The three introductory quotes point to recurring issues in this chapter; how language is acquired through a social practice, the uncertainty that surrounds the role of ICTs in such a practice, and how such a practice enculturates participants through the mutually constitutive educational discourses of teaching and learning. In other words, it is in the *practices* that develop that we see how the school subject, technologies, and didactics interact and produce new educational opportunities.

A consequence is that learning and teaching are seen as two aspects of educational practice, as an interactive process of the two[57]; e.g. as in participating in an EFL community. A teacher would be the more knowledgeable peer, an 'expert', in such a community. The present chapter can thus be read as an argument for how a sociocultural position of participation subsumes the 'learning' and 'teaching' of a knowledge domain. In other words, the aim of the present chapter is to map this 'triangular' field by showing how change and development in subject matter, technologies, and didactics converge around the 'axis' of a sociocultural perspective on transformed practices.

The intersection of the three fields amounts to a phenomenon that currently has no equivalent to a 'state of the art' description. Consequently, Chapter 3 should be read as a contribution to such a description. In the case of the three constituent factors – EFL, ICTs, and didactics – the present chapter aims to illustrate how they historically have been constituted through scientific discourses that can roughly be termed behaviorist, cognitive, and sociocultural. These perspectives are used to frame the composite field of EFL, ICTs and didactics by identifying possible paradigmatic determinants such as view of language and language teaching, use of technology, research issues and focus etc. For an overview, see Table 3.1 in Chapter 3.12. However, first a delimitation of the complex and composite field is necessary.

3.2. A composite field

What is a field? Traditionally, e.g. English as a Foreign Language (EFL), Information and Communication Technologies (ICTs), and Didactics[58] have constituted separate research

[57] In English (and Norwegian among other languages) *teaching* and *learning* are separated while Russian offers the word *obuchenie* as a joint term for the two. Thus, Vygotsky can be said to make use of a construct of 'teaching-and-learning'.

[58] See footnote 2 in Chapter 1.1 for an etymological note on the term *didactics*.

fields. In the present chapter they will be dealt with briefly under separate headings. However, at the risk of simplification and superficiality, their separate fascinations will have to yield for an approach that looks at the synergy and complexity that emerge when these strands converge. There are studies that define the field of technologies and teacher education through a subject matter focus (Willis, 1993), however, the present study aims to analyze the *interplay* between technologies, subject matter and issues of teaching and learning in an organic, ecological sense.

The present study argues that the emergent and composite field of knowledge domain, technologies, and (subject) didactics represents one of the biggest challenges for teacher education and in-service training[59]. Moreover, this study also argues that there is no decontextualized, didactic 'method' that can help teachers negotiate the challenges involved. Rather, we see issues of literacies and social practices that are situated; they are historically, culturally, and socially contextualized. Taking the subject didactics of English as a Foreign Language (EFL) as an example, the picture is especially complex[60]. Dynamics are partly found within changes that the subject matter – the English language itself – is presently undergoing, partly within the rapidly changing technologies, partly within theories of language learning and partly within the socio-political context for human interaction (cf Chapter 3.3 below). Hence, the didactics of English as a Foreign Language, including learner and teacher roles and the learning environments within which teachers are expected to practice, is facing a set of tensions that cannot be resolved (sometimes they should not) unless all these elements are viewed as mutually constitutive for learning processes.

3.2.1. No State? Which Art?

A research field is often approached from its "State of the art", the highest level of development at a particular time[61]. Usually, this means a survey of the literature pertaining to the field in question. However, as the previous sub-chapter points out, the research field of the present study is a composite one that draws on (at least) three separate domains (EFL, ICTs, didactics). Where these converge is an under-researched phenomenon and, consequently, not well documented in research literature. The implication for the present study is that there is no survey of literature on the phenomenon researched that might be said to constitute a state of the art, the phenomenon simply has not produced any such state. Instead, the present study aims to identify current trends in the separate fields and how these relate to the research questions (cf Chapter 1.2).

However, the three fields share a common denominator in the fact that they are approached from a distinct – sociocultural – theoretical perspective. In the present study a sociocultural perspective is considered to represent a state of the art of the theory of learning. Chapter 2 has aimed to show how a sociocultural theory transcends behaviorist and cognitivist perspectives on human conduct and captures the social and cultural relations between humans and artifacts and where the basic assumption is the sociogenetic nature of cognition.

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[59] The distinction between education and training is deliberate. The former encompasses all the aspects of being a teacher while the latter often targets certain skills within the educational vocation. However, implicit in the present study is the view that e.g. in-service training targeting ICTs must include theoretical perspectives, thus approaching a more comprehensive, educational perspective.

[60] This is not to say that the didactics of other subjects are less complex. Our understanding of e.g. Biology and Physics is undergoing radical change as well, forcing teachers to face massive challenges. Hopefully, the present study's focus on EFL might transcend the particular didactics associated with this subject and point to more general didactic concerns.

[61] One such example is the Survey of the State of the Art in Human Language Technology <http://cslu.cse.ogi.edu/HLTsurvey/>

As for the composite field examined under the sociocultural lens, a few introductory remarks are needed.

As ICTs have continued to make a growing impact on education, several studies have addressed the composite domain of ICTs and learning[62]. Also, quite a few studies have addressed didactic concerns when teachers encounter technologies[63]. Finally, the intersection of ICTs and foreign language learning and teaching have spurred several studies[64]. These latter studies often address changes in subject matter as a result of technological impact and/or its consequences for educational practices, e.g. how the English language is transformed and how it is learned in diverse social and cultural settings including out-of-school situations.

However as mentioned above, where all three fields – school subject, technologies, and didactics – converge, there is less to be found in research literature. When questions of teachers, learners and technologies are raised, the school subject is often unspecified (Lankshear et al., 2000), and the same goes for technologies (Orlikowski & Iacono, 2001). When a defined school subject or a knowledge domain constitutes the point of departure, literature often takes on prescriptive approaches ranging from collections of ideas and recipes (Bakke & Millar, 2000; Hardisty & Windeatt, 1989) to more methodologically reflective examples of good practice (Harboe, 1999; Warschauer, 1995), and with taxonomical and historical perspectives in between (Brierly & Kemble, 1991; Levy, 1997b). More comprehensive studies of this complex field, which include an integrative approach to learning and teaching, to technology and foreign languages as complementary forms of discourse, and to theory and practice do exist (Warschauer, 1999; Warschauer & Kern, 2000) but will often surface in discussions focusing on new literacies (Cope & Kalantzis, 2000; Durrant & Green, 1998; Edwards, Nicoll, & Lee, 2002; Luke, 2000; Shetzer & Warschauer, 2000).

Finally, while one might go into lengthy discussions as to how a second language (L2) differs from a foreign language (FL) and the implications for teaching, this study takes the position that – at least in the case of English – this is an unproductive dichotomy. Sandra J. Savignon, one of the authorities on communicative language teaching dismantles the dichotomy:

> *I have made a deliberate effort to blur the distinction between the contexts for foreign language teaching and for second language teaching, a distinction that, while useful in delineating features of access to the second language and of teacher preparation, obscures the common goals of multilingualism: the empowerment of learners and world understanding (Savigon, 2002:23).*

[62] See e.g.Burbules and Callister (2000) and Cuban (2001) for a critical approach, Dillemans, (1998) for an organizational approach, Koschmann (1996a) and Littleton and Light (1999) for a theoretical approach, and Schofield (1995) and Garner and Gillingham (1996) for classroom studies.

[63] See e.g. Becker (1994) on exemplary and novice teachers, Capper (2000) and Hughes (1997) on inadequate training, Garner and Gillingham (1996) and Zhao (2002) on the importance of settings and classroom contexts, Kuure and Taalas (1999) on teacher roles and identities, Lankshear et al. (2000) on teachers' need for technoliteracy, Spector (1999) on the need for teachers to take part in design processes, and Yamagata-Lynch (Yamagata-Lynch, in review) on the importance of collective and communal approaches.

[64] See e.g. Chapelle (2000) on networked CALL, Crystal (Crystal, 2001b), Wark (1997), and Warschauer (2002) on the impact of the Internet on languages, Debski and Smith (1997), Egbert (2002), and Warschauer (Warschauer, 1997, 2000b; 2000) on how networked ICTs emphasize the social and situated elements in CALL, and Goodwyn et al. (1997) on curriculum and literacy.

The same position is advocated by Claire Kramsch (2000a:315), "there are many cases in which this distinction does not hold, for example, the teaching of English as a foreign or international language". One could add that as foreign languages become globalized as electronic networks spread, the distinction between a first language, SL and FL may become further eroded (Lund, 2001).

The following sections present a look at the composite field of EFL, ICTs, and didactics, starting off by taking a look at how the English language is undergoing great change. These fields will then be related to a sociocultural perspective. Finally, convergence of the three fields as they are subsumed under the latter perspective will lead up to a discussion of what this means for classroom practices and teachers' appropriation of ICTs.

3.3. Recent trends in English

3.3.1. 'Englishes'

The English language is in a state of flux. This is hardly news for any language but for English, the changes are quite dramatic and the consequences have quite some impact for our understanding of this language and the didactics of EFL. Moreover, these changes are closely connected with the impact of digital and networked technologies. Consequently, this issue is particularly relevant for ICT-rich settings.

First, the sheer number of English speakers (including L1, ESL, and EFL) is steadily growing and may be estimated to have reached perhaps 1,500 million people (Crystal, 1998:61). This figure is intriguing considering the fact that four centuries ago English was spoken by approximately one million people in the London area (Cope & Kalantzis, 2000b:3).

Second, this figure represents an uneven distribution where English as a first language accounts for 320-380 million users, English as a second language accounts for 250-300 million users, and English as a foreign language accounts for the rest. One consequence is that there may be more educated speakers of English among the EFL users than in any of the other segments, another that with so many variants there might be disagreement as to what is appropriate, correct, and functional English. While English is a *lingua mundi*, it is also breaking into separate styles. In the words of The New London Group: "Clearly the main element of this change was that there was no singular, canonical English that either could or should be taught any more" (Cope & Kalantzis, 2000:5). In short, English as a World Language, *Global English*, poses some interesting didactic questions to teachers in the field, questions related to standardization and the status of the many variants.

First, what is the definition of Global English? Rita Raley (1997) determines the construct through four instances of use: 1. As an international resource, literally a global language. This view is attributed to David Graddol (2001), 2. as a set of new Englishes, new variants in use all over the world. This view is attributed to David Crystal (2001a), 3. as an imperial force with a particular impact area in new literature in English. As such, it is simply a replacement phrase for 'Literature in English'. 4. as a universally comprehensible dialect of English, a simplified version that is easily accessible for all users worldwide and intended to make automatic translation easier, used by e.g. manufacturers like Caterpillar, Boeing and Lotus. It follows that the term 'Global English' invites various approaches to and perspectives on the phenomenon, but carries implications of non-natives communicating with non-natives. In the following, the term is used much like Crystal does in the sense that it incorporates a variety of 'Englishes'.

Third, this development is propelled by an exponential growth in the number of people with access to ICTs and digital networks. As of September 2002, English is the leading language on the Internet with 230,6 million speakers, 36,5% of the world's "on-line population" of 619 million people (Global Reach, 2002). There are approximately 215 million web pages in English, i.e. 68% of the total number (op.cit).

The notion of *diasporas* is particularly relevant in light of the media society and new technologies. We might say that today a digital diaspora is taking place but where the English language is transported without its 'carrier'; the speakers of the language. This networked distribution or transportation has resulted in a complex situation where English is found in different communities, at different levels of the community, in many variants and far removed from the notion of a national language as a girder in the nationalist state (Kalantzis & Cope, 2000a:140). The *British Council* has estimated that by the year 2000, more than 1,000 million non-native speakers will be learning English. The most common situation for an exchange in English is between two EFL speakers. Countries are in transition regarding their use of English, and Norway is among the 19 countries seen in transition from EFL to L2 status[65] (Graddol, 1997:11).

English is gradually losing its position as a primarily Anglo-American discourse. The result is English as a polycentric or 'pluricentric language' and 'world Englishes' (Kachru & Nelson, 2001:9). There may still be a written standard of English serving global communication, but variants of English that draw on diverse sources regarding both linguistic and (sub-)cultural features are making themselves felt. David Graddol (1997:49) reports of young people in native speaking communities who experiment with their identities by making use of Afro-American English in order to identify with American sports and culture. Another example is MTV. The music channel makes use of young people who speak a variety of Englishes with distinct accents denoting Italian, French or German as a first language. Global teenage culture seems to be less influenced by a 'standard' than ever. Consequently, English as a foreign language seems to gravitate towards local functionality while at the same time struggling to maintain a global convention, at least in print:

> *Other countries are not learning English for our benefit. English is neither our property nor is it static. The English spoken in international contexts, for example by Finns to Italians, Brazilians to Russians, is no longer UK English or even US English. And as UK English continues to become effectively a dialect of international English, like all dialects its currency will become localised (Nuffield Languages Inquiry, 2000:15).*

The same paradox is addressed by other researchers. Lo Bianco (2000) finds that while English is truly becoming a global language it also splinters into multiple Englishes. We might say that as English increasingly becomes a multi-faceted global resource, the notion of the 'native speaker' as an ideal becomes less relevant – Global English has no native speaker.

[65] One indication might be the rapid increase in the use of English at College and University level, both in the form of publications and lectures. Nearly eight out of 10 research papers are in English. This trend applies to both private and public sectors (Kullerud, 2003). Another indication is found in *The Committee for Quality in Primary and Secondary Education in Norway* who place English among five *foundational* competencies (along with literacy/numeracy, digital competence, learning strategies, and social competence). A summary in English is found at <http://odin.dep.no/ufd/norsk/satsingsomraade/kvalitetsutvalget/045071-990226/index-dok000-b-n-a.html>

How will this be met by teachers and learners of English? Will it challenge and change future curricula and didactics? "Some teachers, (…), allow the new forms into their teaching; others rule them out"(Crystal, 1998:195). Kachru (2001:22) concludes on a more normative note: "…it is most important in teacher training to create teacher awareness of the status and functions of Englishes in the world today and in the future". This becomes even more complex and important when we see what happens when the many variants of English are spread by the many digital communication channels in a networked world.

3.3.2. Netspeak and Netlish

Having seen that English – or rather, a variety of Englishes – constitutes a truly global linguistic phenomenon, the question arises as to what effects this has on the language as it emerges in digital and networked media. The present study does not investigate the many local flavors that materialize, that is beyond its scope, but a closer look at what characteristics English takes on in digital and networked environments is pertinent since they will have consequences for the school subject. Like Global English, Online English exhibits variants determined by situational factors. In his book on language and the Internet, David Crystal (2001b:17) uses the generic term *Netspeak* for online language use and reserves *Netlish* for the English language. A perhaps more established term for the first item would be *computer-mediated communication* (CMC)[66]. Both will be used in the following.

Crystal (op.cit.) gives a detailed account of the linguistic identity of email, chatgroups, virtual worlds, and the World Wide Web. Through tracking changes and innovations in genres, structural elements, vocabulary, orthography, punctuation and discursive markers he arrives at the conclusion that,

> *The phenomenon of Netspeak is going to 'change the way we think' about language in a fundamental way, because it is a linguistic singularity – a genuine new medium. (…) For Netspeak is something completely new. It is neither 'spoken writing' nor 'written speech'. (…) It is, in short, a fourth medium. In language studies, we are used to discussing issues in terms of 'speech vs. writing vs. signing'. From now on we must add a further dimension to comparative enquiry: 'spoken language vs. written language vs. sign language vs. computer-mediated language. Netspeak is a development of millennial significance (Crystal, 2001b:238-9).*

Even if Crystal to some might appear somewhat hyperbolic and that CMC features are not genuinely new but just an extension of situational variants, there seems to be consensus that Netspeak represents a larger repertoire of interaction. It allows for diverse types of multi-user real-time instant written interaction that exploits textual expression more than before (Hård af Segerstad, 2002, cf classroom observations in Chapter 6, e.g. the use of the 'e-turn' in Chapter 6.4.6). Segerstad (op.cit) argues that CMC does not represent a depleted or reduced form of language but rather that it adds to existing practices with its synchronous and innovative character.

This extended mode of expression also opens up for experiments with online identities, a well known phenomenon from several studies (Debski, 1997; Kirkup, 2002; Palloff & Pratt, 1999; Turkle, 1995). In a study of Norwegian learners' first encounter with a virtual classroom, a particular form of hybrid Netlish is found to mediate the process of learners establishing a presence through written language only (Lund, 2001). Such appropriation of Netlish by new

[66] In a recent review of Crystal's book, Steven L. Thorne (2003:24) also suggests *CMC* or *electronic discourse* instead of Crystal's "overly cute term".

groups of learners, poses one of the more interesting areas of future research, not least because it takes place mainly outside of institutionalized educational systems. In addition, with the written language manifesting itself in digital settings, the architecture and design of such settings change. Hypertextual elements bring a multilayered, 'three-dimensional' feel to language, while colors, fonts, graphics, sound and animation blur the line between conceptual and perceptual reading. Language as we used to know it is gradually being immersed in additional modes of expression (Bostad, 1994).

A consequence of global and online developments of English is that,

> *The language classroom will lose all credibility if it is defined as only a counter-culture to new trends developing. An inevitable consequence of this development is that the language will become open to the winds of linguistic change in totally unpredictable ways* (Crystal, 1998:130-31).

EFL used to be a school subject that offered a systematic approach to a generally standardized language and the English-speaking world in it which resides. Looking ahead, EFL might address issues related to communication forms, register, and linguistic diversity - reflecting on how we project ourselves on- and offline. The new *literacies* involved will be discussed below.

So far the educational system has put learners loyal to linguistic standards at an advantage. Learners breaking or stretching norms through the use of global and online variants represent a challenge to teachers whose efforts are eventually acknowledged according to their learners' success at the exam table. Without going into a discussion that will inevitably have to be raised, the present study argues that unless we develop a standard for intelligibility, we will end up with fundamentalist relativism in which anything goes as long as it is intelligible or a 'standard' that excludes several cultures-of-use. On the other hand, unless we face the fact that functional language may come in many socioculturally constructed variants, we risk school discourse to be suffocating for out-of-school discourse. This is truly a paradox for EFL in the new century and can probably only be overcome by more focus on foreign language learning as socially constructed discourses, as important aspects of the socialization processes where there is a precarious balance between tradition and innovation. Increasing awareness on the relationship between identities, contextual and linguistic components might provide both teachers and learners with more opportunities for meaningful communication in a foreign language (Block & Cameron, 2002b).

Taken together, Global English and Online English point to the circumstance that English is learned in powerful out-of-school contexts, perhaps even more than in-school contexts, making it more similar to L1 acquisition. Out-of-school-contexts are rich in non-standardized variants that may be regarded as innovative and functional outside the classroom but may be seen as challenging or even harmful in a curricular perspective. This means that there exists a strong element of out-of-school language socialization (Roberts, 2001) that is not easily compatible with the traditional perspective on language learning within the educational system. There are (at least!) two discourses and learners have to commute between 'approved' and 'disapproved' variants, unless out-of-school discourses are acknowledged in the classroom. This means that there are both centripetal (standardization) and centrifugal forces (fragmentation, hybridization) at play. Still, according to McArthur (quoted in Crystal, 2001 :56) "…this latter-day Babel manages to work". Or in the words of McKinsey Wark:

> *On the net, nobody pays too much attention to grammar and style. On the net, one sees the shape of language through the little mistakes and fissures that in printed texts editors remove. What emerges is a whole range of writing 'Netlish', where non-native forms of English writing come in contact with each other, and with native forms, without being passed through a single editorial standard* (Wark, 1997).

Kachru expresses concern for teachers, "it is most important in teacher training to create teacher awareness of the status and functions of Englishes in the world today and in the future" (Kachru & Nelson, 2001:22). David Crystal, in one of his rather few excursions into educational implications of 'Netlish', is even more uncompromising:

> *And above all, teachers need to develop a truly flexible attitude towards principles of usage. The absolutist concept of 'proper English' or 'correct English', which is so widespread, needs to be replaced by relativistic models in which literary and educated norms are seen to maintain their place alongside other norms, some of which will depart radically from what was once recognized as 'correct (Crystal, 2001a:60).*
>
> *And for English language teachers, attempting to emulate prophets, the message is plain. Get familiar with the innovative language of the new technology as soon as you can; for the twenty-first century will see more linguistic change in English than we have seen at any time since the Renaissance. With language, too, we ain't seen nothing yet (Crystal, 2001c:154).*

This points to a radical shift in goals for foreign language teaching and heralds a tapestry of new linguistic conventions. New modalities will make demands on the EFL classroom, by virtue of the impact they have on language communities but also as they bridge the distance between language communities. Defined levels of proficiency that relate to a standardized set of criteria will be challenged and extended (not supplanted) by a view where "All language is meaningful only in and through the contexts in which it is used" (Gee, 2000:63).

3.4. Teaching English as a Foreign Language

English as a school subject has a long history in Norway. It has nearly always had a central place in Norwegian curricula as a mandatory subject, and where it has been offered as an optional, in-depth subject, it has enjoyed quite some popularity. Since the L97 reform (Lower Secondary School), it is taught from the very first year in the educational system and (optionally) right into the 13th and final year. In syllabi following both the R94 reform (Upper Secondary School) and the L97 reform English is introduced as a *lingua franca*, but with a marked Anglo-American bias. It is a subject that addresses aspects of personal formation and culture – *Bildung* (see Chapter 3.9.3 below) – as well as skills and proficiency.

3.4.1. Some influential approaches to language teaching

In her comprehensive volume on language didactics, Aud Marit Simensen (1998) shows how different perspectives on and theories of language learning have manifested themselves as methods in the foreign language classroom. Method is here understood as "a theoretical model that comprises a standardized set of principles and procedures" (op.cit.:16). Wilfred Decoo (2001:4) offers a more ambitious definition: "A method is a teaching-learning model that emphasizes a core concept as the key solution to successful language learning". Such a core concept is found in a particular view of language and the way this view influences the way a language is taught, a method or (when grouping similar methods) approach. This means that a view of language and a view of learning are both present when we discuss approaches to language learning. Simensen discusses two very different types of approaches; one

mechanistic and one mentalistic. A third, sociocultural perspective, will be discussed later in this chapter.

According to Simensen (1998), in Norway the *grammar-translation method* (TG) with its predilection for memorizing rules and facts dominated foreign language teaching up to ca 1925. The focus was on reading and writing more than speaking and listening, and morphology and syntax were core elements in a TG-oriented curriculum. Accuracy was emphasized, formal aspects of the language were taught deductively and the learner's native language was the medium of instruction. "It is a method for which there is no theory" (Richards & Rodgers, 1986:5).

TG was largely replaced by a more inductive approach that came to be known as the *direct method*. Interest shifted towards the study of spoken language, usage instead of translation, and a monolingual approach to teaching. In Norway, this approach dominated the years up to around the middle of the 20th century. According to Richards and Rogers, the direct method represented "enlightened amateurism" and "failed to consider the practical realities of the classroom" (op.cit.:10) despite innovations in teaching procedures.

A structural view approaches linguistics from an objectivist position in which the goal is to master a system of structurally related elements. Relations between linguistic elements are seen as rule-governed. A behaviorist flavor is found in its emphasis on drill and practice, exercises and repetitions. Reinforcement and correction are central control mechanisms. Habit-forming language patterns are encouraged. One variant of structuralism is found in the *audiolingual method*. It concentrated on listening and speaking skills, intensively developed through *"programmed instruction"* (Simensen, 1998:57, emphasis in original). However, around 1970, the audiolingual method declined. Partly, it was found that learners often were unable to transfer acquired skills to authentic communicative situations beyond the classroom; partly the theoretical underpinnings of audiolingualism, i.e. structuralism and behaviorism, came under attack. Still, in Norway "the most audiolingually-oriented syllabus guidelines of the school subject were published in 1974" (op.cit.:60).

The 1970s saw the audiolingual characteristics of memorization and pattern practice yield to a view of language that triggered plethora of methods with *communicative competence* as their goal. Dell Hymes, the American anthropologist and linguist who introduced the concept, emphasized rules of use more than rules of form and focused on language as social behavior (Kramsch, 2000a:2). Still, most communicative approaches have been grounded in an individual, cognitive and mentalistic view of learning.

This latter approach is often attributed to Noam Chomsky (1975; 1980; 1986) who criticized structuralism for being mechanistic and for neglecting mental properties, creativity, and underlying competence in the individual. Chomsky effectively demonstrated the shortcomings of structuralism and went on to have a profound and lasting influence on the more academic linguistic disciplines. As for language learning and teaching, his theories did not gain a similar foothold (Kramsch, 1995), much because of his idealized view of language and language performance. Also, from a more pragmatist position he was criticized for only looking at the internal, mentalistic aspects of language, failing to see social aspects of language and contextual factors as constitutive in building competence. *Doing* things with language becomes as important as *saying* things. An alternative rooted in this perspective arose from the British language teaching tradition and was incorporated in language learning and teaching programs under the auspices of the Council of Europe where it has had a

dominating position since the 1980s (Richards & Rodgers, 1986:67-8 has a systematic comparison of audiolingual and communicative language teaching).

As an alternative to the Chomskyan tradition, M.A.K. Halliday's *Systemic Functional Linguistics* (SFL) has enjoyed increasing popularity (Burns, 2001; Coffin, 2001; Derewianka, 2001; Halliday, 2001; Martin, 2001). SFL is interested in variants and not only standards of language, especially how variants relate to context. This context is found on two levels; the immediate situation and the cultural context. Moreover, SFL views language as socially constructed and embedded in culture, a network of options, not a fixed entity. Language users select (often unconsciously) from a vast array of possibilities. This points to another characteristic of SFL; the relation between context and language, social and cultural roles of language are in focus (Lund, 2001, see also Chapter 6 for illustrations). With its communicative, contextual, and functional disposition, SFL has been influential in shaping a sociocultural perspective on language learning and teaching (Wells, 1999).

A communicative view of language involves a communicative approach to teaching, in itself a vast topic. As the term *communicative* implies, the focus shifts from linguistic units and accuracy to global characteristics like fluency coherence, cohesion and authenticity. *Meaning* takes precedence over formal aspects, *interaction* takes precedence over structure, and *functionality* takes precedence over accuracy. The teacher's role is not primarily that of a controller, instead there is a series of teacher roles that supports and encourages the learner in her acquisition of the target language. Terms like facilitator, organizer, and participant are among those that have been applied to teachers in the communicative classroom. In the current Norwegian EFL curriculum, the competencies involved are grouped into six categories: 1. *Linguistic* (formal aspects), 2. *Sociolinguistic* (contextual appropriateness), 3. *Discourse* (unity, continuity, coherence), 4. *Strategic* (repair, compensation), 5. *Sociocultural*[67] (e.g. empathy), and 6. Social (will and skill to interact) (Simensen, 1998:108 - 9).

Does communicative language teaching subscribe to a particular theoretical perspective of learning in general? Aud Marit Simensen summarizes:

> *The currently dominating L2 learning theories may be characterized as mentalistic in the sense that they focus on what the learner brings to the learning task in terms of innate mental faculties, features normally associated with the term 'nature' (…). They may also be characterized as cognitive in the sense that they focus on the processes of the mind, i.e. on the development and use of knowledge or cognitive structures (Simensen, 1998:80).*

Among mentalistic and cognitive models that have influenced the foreign language learning classroom, two should be mentioned briefly[68]. A particularly influential idea is Stephen Krashen's construct of *language acquisition* (Krashen, 1988). According to Krashen, acquisition takes place on a deeper, unconscious level as a result of 'real' communication, much like first language development. *Learning*, on the other hand, refers to the conscious efforts of internalizing input (usually formal aspects) from instruction. A consequence is a downplay of the role of formal instruction and a more constructivist approach to language

[67] The term *sociocultural* in connection with competence must not be confused with the theoretical perspective using the same label. Here, the term is not used as a theoretical term but one that addresses cultural awareness.
[68] A third approach might also be relevant: Michael Lewis addresses *lexis*, in particular collocations and 'chunks' of language as the key to language acquisition (1993). In collocations, Lewis finds a generative element that gives rise to his tenet of '*Observe - Hypothesise – Experiment'*. However, cultural-historical context and social setting are downplayed in favor of the purely linguistic context.

learning. However, the learned formal system can serve as a monitor or editor of the eventual output. Also, Krashen's *input hypothesis* (1992) should be mentioned. It claims that learning takes place when a learner is exposed to input that is comprehensible but slightly beyond the learner's current ability (cf Chapter 2.3.6). According to Simensen (1998:83), "The monitor theory has had a tremendous influence on L2 teaching worldwide". Nevertheless, critics have pointed to a relative neglect of language production (see next sub-chapter). In Krashen's model, a teacher would be the primary source of comprehensible input, a designer of learning environments that have few or no affective filters, and an orchestrator of a rich mix of activities (Richards & Rodgers, 1986:137 – 8).

Also, C*ontent and Language Integrated Learning* (CLIL) has had an impact on some schools in Norway (Hellekjær, 1996). In this model, the foreign language takes on a mediating role for a particular subject matter and vice versa, e.g. in the form of a school subject. With its added element of immersion such a method deviates from the others discussed above. Still, it might be regarded as one more variant of communicative language learning.

From ca 1975 until the time of writing, communicative competence as a linguistic concept and a corresponding communicative approach to teaching a foreign language have been introduced (through reforms) and, thus, determined EFL curricula in Norway, in lower as well as upper secondary school. Meaning, input, discourse, learner autonomy and interactional components have at the time of writing become salient features of these curricula. During the same period, ICTs were introduced but, paradoxically, not in a corresponding theoretical framework (see Chapters 3.6 and 3.7 below). As Wilfred Decoo (2001:9) notes, with the advent of the Internet "existing methods jump on the bandwagon" by just exporting their characteristics to digital and networked media. However, an alternative to the mostly individual and cognitive models also developed during the last decades of the 20th century, in the form of a sociocultural view of language learning. This perspective has (as discussed in Chapter 2) in many ways come to represent a paradigm shift with its emphasis on social interaction, artifacts and their mediating potential.

3.4.2. Paradigm shifts[69]

Claire Kramsch condenses the past century's views of language learning and teaching into four paradigms influenced by one or more dominant host disciplines (Kramsch, 2000a:313). Before WWI, philology was the reference science, between the two wars psychology and emerging pedagogy dominated, after WWII theoretical linguistics ruled while the 1970s saw the emergence of the cross-disciplinary field of linguistics, psychology, and education. This overview roughly corresponds to the above brief overview of approaches.

In a mock-cynical manner, Wilfred Decoo (2001:14) suggests an alternative definition of method: "A language teaching method is an approach that neglects at least one important component". He illustrates this by suggesting an Achilles heel as the reason for the decline of influential methods: GT failed because it neglected lively communication, the direct method failed because it neglected the developing insight, the audio-lingual method failed because it neglected cognitive learning, and communicative methods are failing because they neglect careful progression and lower-order automatization.

[69] This term is rather ambitious in its Kuhnian context. It is not sought justified where it is used, but rather used with caution and mostly reserved for cases where it is used by a cited researcher.

Simensen (1999) has shown how shifts in language *learning* paradigms have led to shifts in language *teaching* paradigms and how they both relate to paradigm shifts in the more general fields of learning and pedagogy (1998). These shifts have, to greater or lesser extent, been absorbed by national curricula and policy papers. Language teachers have been educated within a given paradigm that has tended "to be regarded as a panacea to cure the shortcomings of previous methods, known as the panacea fallacy in foreign language teaching." (1999:7). Instead, she advocates an approach to theories of language learning and teaching where description, consciousness-raising and classification are key purposes and where the situation and context of the subject didactics take precedence over possible prescriptive aspects. (op.cit.:7-8). Since teachers will face more than one paradigm shift in their careers they should be prepared for the paradigms to come.

This is a sound position when looking at didactics and teachers' practice within EFL and ICT-rich environments. However, there may be a need to look beyond general preparedness and pragmatics and ask what theoretical perspective seems to offer a view of language learning and teaching in which technological artifacts are integrated and not just seen as add-ons.

3.5. Recent perspectives on language learning and teaching

The very brief survey in the previous sub-chapter places language learning, EFL and TEFL included, in a basically cognitive and – at least partly – an individual tradition. However, in the 1980s and 90s aspects of culture, identity, and social practices came to gain momentum. The dichotomy between the individual and the social plane, between cognitive and the contextual factors was questioned and ultimately rejected (cf Chapter 2). A sociocultural perspective sees individual and collective levels as dimensions of human activity, not as separate or dichotomous levels of description. Also, and in line with Vygotskian theory, the dichotomy of language and thought is negated. Instead, "Sociocultural theory argues that while separate, thinking and speaking are tightly interrelated in a dialectic unity" (J.P. Lantolf, 2000:7).

In language learning, sociocultural perspectives brought about an interest in how spoken and written activities are situated as a result of how interlocutors position one another in time and space. Cultural conventions and resources are brought into focus, not just as an added dimension to language learning, but as being constitutive of the learning process and the formation of social identity (Candlin & Mercer, 2001; Kramsch, 2000a, 2000b; J.P Lantolf, 2000; Thorne, 1998; Warschauer, 1997; Warschauer & Kern, 2000, among others). The roles of teacher talk and classroom discourse are considered important in this process and currently several volumes address classrooms and foreign language teaching in their social contexts (Burns & Coffin, 2001; Candlin & Mercer, 2001; Hall & Verplaetse, 2000). In the following, focus will be on issues of affordances and socialization related to language learning and teaching.

Stephen L. Thorne (1998:4) recounts the "heated debate between cognitive and social theories of SLA"[70]. From a sociocultural point of view, Thorne criticizes the predominant view of SLA for being "individualistic and mechanistic, and that it fails to account in a satisfactory way for interactional and sociolinguistic dimensions of language" (op.cit). Concluding that the predominant view is seriously flawed, he argues that it hinders our understanding into the

[70] Indirectly, this debate is also found in many of the contributions in Lantolf's edited volume (2000), where communicative, cognitive and structural perspectives often are questioned. This may be the first comprehensive volume on sociocultural perspectives and language learning. To the present researcher, it represents a seminal work in the field.

nature of language, and especially a foreign language. The static idea of the non-native speaker (NNS) as a learner and the ideal as being that of an educated native speaker (NS) must give way to several social identities including the ones formed in the contexts of classrooms and out-of-school practices. As e.g. the logs from online interactions in Chapter 6 show, this is very typical of learners appropriating new communication forms in a playful approach. Kramsch also addresses the status of the learner from a Vygotskian perspective:

> *The FL learner is viewed not as an individual mind, who, like a computer, is intent on assimilating certain linguistic structures, but as a social and cultural being whose psychological processes are first experienced as social processes of interaction with others and are only later internalized as individual cognitive processes (Kramsch, 2000a:318).*

Performance is determined through learners' abilities to utilize resources and to transform them into *output*. This requires human agents who use language to construct meaning from *affordances* found in the social context.

3.5.1. Beyond input/output: affordances

The construct of *affordances* (see footnote 11 in Chapter 1) is well known in a sociocultural perspective where it has come to be regarded as the opposite of the constraints of the mediational means (Wertsch, 1998:40), as "properties of an object that neatly support the actions people intend to take with the object" (Nardi & O'Day, 1999:28), and as the collaborative construction of opportunities or occasions for learning (J.P. Lantolf, 2000:17). This leads to a social rather than a biological approach to the construct (Etienne Wenger points to the fact that the roots of the construct are found in ecological psychology "where it refers to the relation of an organism to its environment" (1998:298)). In the present chapter, Leo van Lier's ecological approach (2000; 2001) to language learning is used to illustrate the construct:

> *The term* affordance *specifically refers to those aspects of the linguistic environment that become perceivable by the learner as the result of meaningful activity. Affordance is neither the external language nor the learner's internalization of it. It refers to the relations among the engaged learner, meaningful signs, and relevant properties of the real world (van Lier, 2001:105, emphasis in original).*

Emergence is the key word for van Lier. He shifts the focus from 'reaping' - evidence that documents learning - to "'sowing' events, which lead to the emergence of complex language as a result of activity in proximal contexts" (2000:255).

Although van Lier is not writing about language learning in technology-rich settings (or explicitly discusses the role of the teacher in such an ecology), his view of the learner "immersed in an environment full of potential" (op.cit.:246) rings particularly true with regard to such settings. For instance, the Internet provides opportunities for a) negotiating interactive content or finding information; b) communicating synchronously or asynchronously with native or non-native EFL speakers; c) simulating experiences that are difficult or expensive to set up in co-located contexts; and d) publishing learners' own material for potentially millions to see. This does not mean that morphology, vocabulary, syntax, structures, rules and input are obliterated, but that learning and teaching a language through social interaction focuses on language as relations of thought, action, power and meaning-making. The learning environment is not merely additional input but represents a "semiotic budget" (op.cit.:252), the opportunities or potential for action. How the construct of affordances is operationalized

in classroom practices, and involving offline as well as online settings, is illustrated in Chapter 6.4.

Affordances are found in the relationships between learners, objects, peers and experts, they are not properties of either of them. If the language learner is actively exploiting the affordances of the situation, this will bring about opportunities for interaction and use of language in very diverse settings and for very diverse purposes. This means that foreign language learning is also intimately linked with development of identities and socialization.

3.5.2. Acquisition and Socialization

Learning EFL has meant partly to acquire certain communicative skills, partly to get to know a culture (Anglo-American with a few visits to other parts of the former empire). Historically, the school subject has often been regarded as something learners should absorb (Candlin & Mercer, 2001). Even though this view has changed through a more communicative approach, it could be argued that for learners English has over the years represented a world on paper in the form of the textbook, one that may not always correspond to the lifeworld of the learner.

Chapter 3.3 argues that language acquisition within the school 'norm' of EFL is inadequate in a life world where Global and Online Englishes are such strong incentives and formative features for learners. Learning EFL might become more like learning a first language. Also, this means that a view of language as something more or less 'fixed' and stable, a product to be consumed and refined must give way for a view of language as socially constructed discourses in which we deploy linguistic elements to construct speech acts under very different conditions.

This view is in line with Vygotskian tradition and its emphasis on language as the primary psychological tool. But where Vygotsky pointed to the single word as the central unit of language (Vygotsky, 1986:e.g.212), later approaches have concentrated on social, contextual and interactional variables as units of analysis with the learner exercising agency more than acting as a recipient of input. *Transformation*, not *transmission*, is the ecological term often used to describe this extended perspective where language is closely connected to the ways we shape and reshape our social worlds. In this view, language is a tool for action, interaction and participation, always embedded in cultural practices. This means that speech acts are constituted in various contexts, in various discourses. School, in the shape of the language classroom, represents one instance of discourse, and right up to recent years the dominant one for acquiring a foreign language. Now, new social practices are a keystroke (or a short flight) away and with them more emphasis on getting meaning across in a certain manner in a certain medium. "In a sociocultural perspective, communication is the primary issue and cognition means appropriation of communicative tools" (Säljö, 2000:198, my translation).

The distinction between language as an abstract system of rules on the one hand and conventions and its communicative, functional aspects on the other is important when analyzing learners' appropriation of the foreign language. It means bringing the learner as a social being into the language learning process to a greater extent than before. "Looking at the 'whole social person' argues for a more holistic approach to second language development than orthodox SLA studies offer" (Roberts, 2001:109). Focus shifts from the subject matter at hand (EFL) and the way it is processed in the minds of learners to the way the many options of the language present learners with *choices*. Furthermore, how learners choose according to their life worlds, their social and cultural practices and their sense of identity as being conveyed in particular variants becomes essential. Celeste Kinginger is quite explicit:

> *The acquisition of language is fundamentally embedded in the process of socialization. Social interactions are the sociocultural contexts within which children's participation leads to performance competence and cognitive skill (Kinginger, 2000:29).*

Language is primarily seen as part of social settings and relations, communities, rather than a system encapsulated in the brain. Becoming part of communities is a process of identity forming and of belonging. The center of attention is *externalizing* language rather than *internalizing* it.

By viewing language in a sociocultural perspective, language acquisition in and out of school can be approached from a theory of learning as a social endeavor. By this is meant that this endeavor is more or less contextually successful, not only linguistically. Outside school learners frequently encounter very different linguistic enclosures, resulting in a tension or conflict when 'school enclosures' fail to meet expectations from other contexts. Some contextual aspects materialize in physical objects (classroom, sports arena, academic literature) while some are communicative or historical (genre, settings). Learning EFL is today an endeavor that draws on many contexts; learners commute between and are part of different discourses where variants of English are heard and practiced like different voices in a choir, but where learners may feel they identify more with one voice than another.

Following the line of reasoning in the previous paragraphs, formation of identity becomes an important aspect of language acquisition. Socialization involves more than just a context for cognition, it means identifying with a particular (language) community, its values, its idiom, its linguistic cues, its idiosyncrasies etc. When learners exercise agency and move beyond input they invariably invest much more of themselves in the process of acting out a new language (Roberts, 2001). To quote Säljö (my translation):

> *No human action can be de-contextualized in an absolute sense. Emancipation or separation from one context involves a re-contextualization within the framework of another activity. Learning is still situated, but in another context with other goals (Säljö, 2000:213).*

Learners may experience such re-contextualization when they commute between in- and out-of-school language practices, between established and not yet fully recognized conventions. For teachers, the inseparability of learners' identity and language use becomes crucial when assisting them in appropriating a foreign language through its different conventions.

3.6. ICTs in learning and teaching

In its relatively short history, ICTs as educational artifacts[71] have managed to play an important part in different learning paradigms. Their use has been influenced by a particular theory of learning and teaching while they have carried intrinsic potential to transform the paradigm they are embedded in. The tensions that arise can be seen as one of the major impulses for ongoing change in education. This topic, ICTs in education, is so vast that it escapes a comprehensive account. Still, its history and current status are important in order to fully understand under which conditions learners, teachers, and artifacts arrange themselves in technology-rich settings. Also, it is necessary to know something about general perspectives

[71] This account is limited to ICTs although there are good arguments for looking at a broader selection of technologies, from chalk and blackboard to the language lab. How these have been absorbed by prevailing theories of learning and often failed in the face of the practical constraints in the working life of teachers have been convincingly argued by Larry Cuban (1986).

on ICTs in education to fully understand how they may come to be appropriated in the foreign language classroom.

3.6.1. Paradigms[72]

The standard work of reference when giving an overview of ICTs in education is Timothy Koschmann's edited volume (1996b) on the "emergent paradigm" of Computer Support for Collaborative Learning (CSCL). He establishes four paradigms in which ICTs have played different roles. These roles are found by examining the "implicit theory of learning" for the paradigm, the "theory of pedagogy"[73], "research methodology" used to identify claims made by ICTs, and what research questions that arise out of the paradigm (op.cit.:4). The resulting four paradigms are in Koshmann's terms labeled as follows (adapted from Koschmann, 1996):

- **Computer-Assisted Instruction (CAI).** First identified in the 1960s, this paradigm is behaviorist-oriented, goals are broken down into units, tasks, that can be effectively addressed by drill, instruction, and response. The core of CAI is a technology-driven approach to learning.
- **Intelligent Tutoring Systems (ITS).** This approach springs out of research on artificial intelligence (AI) in the 1970s. It has greater degree of interaction, flexibility and ability to handle complex problems than CAI. Hence, emphasis is less on the outcome than on the sophistication of the instructional system. Both CAI and ITS are transmission-oriented.
- **Logo-as-Latin.** This somewhat cryptic label refers to a different epistemological perspective. Transfer is replaced by construction of knowledge. Software programs are executable and the learner demonstrates agency over software and not the other way round. This cognitive approach is often associated with Seymour Papert (1993a; 1993b; 1996) and his use of the programming language Logo, hence the name of this paradigm.
- **The CSCL paradigm**. Based on assumptions from the socially-oriented sciences and learning as a situated and social process (cf. Chapter 2), the constructs of *mediating artifacts* become crucial when defining the role of ICTs. The distributed nature of knowledge and collaborative approaches to knowledge building are additional girders in this framework.

The history outlined above shows how perspectives have changed from learning *with* ICTs to learning *via* ICTs. Productive interaction (Littleton & Light, 1999), learning in multimedia and online contexts (Danielsen et al. 1997), new technologies and new forms of practice (Ludvigsen & Østerud, 2000), and distributed learning (Lea & Nicoll, 2002b) illustrate some of the themes pursued. A common denominator is communication and interaction. Consequently, language and how thinking is embedded in uses of language, which again become embedded in and mediated by technologies, have become key elements when ICTs are introduced in education. Although the present study is not on CSCL *per se*, it obviously draws on research in the field and aspires to provide insight into the issues raised above and in particular issues of networked and distributed environments (cf Chapter 2.3.4).

[72] Koschmann uses the term 'paradigm' in the Kuhnian sense. In the case of CALL the term is avoided and substituted with 'distinct type, model' etc.

[73] Koschmann explains this term by also calling it "the underlying model of instruction", thus bringing it close to some aspects associated with didactics.

Koschmann's overview also shows that digital artifacts have gone through a series of shifts from being primarily suited to support instruction and individual autonomous learning to supporting collaborative practices and the joint construction of knowledge. This development is largely dependent on the increasingly distributed nature of ICTs. In an edited volume that addresses distributed learning and technologies from a sociocultural perspective, Mary R. Lea and Kathy Nicoll (2002a) define distributed learning as being concerned with:

- *the breaking down of traditional boundaries between face-to-face and open and distance education;*
- *the growth of new information technologies as mediational means in distributed learning settings;*
- *changes in our conception of the ways in which learning and teaching are distributed across space and time;*
- *learning as a shared enterprise distributed between individuals in several different contexts;*
- *learning as distributed between diverse contexts and not tied to formal institutional settings;*
- *the relationship between global and local contexts of learning (Lea & Nicoll, 2002a:2)*[74]

Together, these items point towards learning as a shared enterprise and how this is mediated by networked technologies. The result is that learning, artifacts, and new literacies become entangled in practices that transcend the discourses of the co-located classroom and the institution, e.g. in the form of curriculum and exam. In the words of Richard Edwards (2002:98), there is a space-time compression as well as "something new in the density of possible interconnections and the fact that they are not simply one-to-one". In particular, the school discipline of English seems to feel the impact of this shift to distributed modes (cf Chapters 3.3.2 and 3.7).

The recognition of cognition as being situated as well as distributed raises crucial questions for didactics, for teachers' roles, and for their appropriation of artifacts. Ralph T. Putnam and Hilda Borko (1999) pose the pertinent question as the title of an article: *What Do New Views of Knowledge and Thinking Have to Say About Research on Teacher Learning?* They approach the questions via three conceptual themes; cognition as situated, social, and distributed. Regarding the latter (the first two have been covered in the course of Chapter 2) they address the question of where to situate teachers' learning experiences, concluding that out-of-school contexts increase in importance along with new discourse communities. One example of such a discourse community is found in Chapter 5 on *The Tower*. There is so far little to find in the way of research on this particular topic, although this situation currently seems to be changing. What seems to be the case, however, is that the social practices found in the notion of 'communities of practice' do not automatically transfer to online environments (cf Chapter 5.8) although there are quite some 'pastoral myths' (Smith & Kollock, 1999). Distributed modes of learning may only poorly accommodate the 'community' metaphor (Kirkup, 2002). In the words of Putnam and Borko (1999:10): "We know little, however, about the impact of these communities on experienced teachers' knowledge, beliefs, and practices". And in a similar vein Gill Kirkup (2002:194) writes, "Finally, there is also significant work yet to be done on understanding the nature of online identity – of students and, more radically, of teachers".

Six years after Koschmann's book, Lipponen (2002:unpaginated) admits that "there exists little research on how students participate in networked mediated collaboration", and that "the

[74] The two latter points will be sought be pursued in Chapter 3 on the changing contexts for learning EFL as well as in Chapter 6 where learners communicate in ways that challenge traditional, institutional conventions for EFL.

clearest failures related to computer-supported collaborative learning environments are that for different personal and cultural reasons, students and teachers are hesitant to use them" (op.cit). Although not using the term, Lipponen here addresses (lack of) *appropriation*. A look at the relatively brief history of Computer Assisted Language Learning may contribute to an understanding of why this is so.

3.7. ICTs in language learning and teaching

According to Karl Marx (1818–1883), history repeats itself, first as tragedy, second as farce[75]. At the risk of being flippant, this observation can be applied to the role of computers in language learning and teaching, most often referred to as Computer-Assisted Language Learning, CALL, but also as Technology-Enhanced Language Learning, TELL (Bush & Terry, 1997). Over the years, any notion of a particular 'CALL method' has been refuted and the need to link CALL to Second Language Acquisition (SLA) research has been acknowledged (Chapelle, 2000).

3.7.1. Distinct types of CALL

Technologies tend to emulate existing practices (Cuban, 1986) but in the case of CALL the years between ca 1970 and up to now can be said to form a condensed version of the paradigm shifts that took place in the whole of the previous century (cf. Chapter 3.6 above). Several scholars have tracked the fairly short history of CALL and noted the same patterns (Kern & Warschauer, 2000; Levy, 1997a, the latter with more focus on changes in technologies from authoring packages to convergence of media; Murphy, 2000).

As the learning and teaching of EFL have been subject to paradigm shifts, so has the role played by CALL. This trend is partly driven by the theoretical development referred to previously in this chapter, partly by technological development from the mainframe computer serving terminals via increasingly powerful stand-alone PCs to networked computers, convergence between diverse forms of digital media, and the distributed character of hypertext/hypermedia.

3.7.2. Behaviorist and structural approaches

The first ventures into CALL in the 1970s consisted of mostly drill and practice software for individual use. Textbook and workbook exercises were digitized in order to make them more efficient and exploit the computer's ability for patience and instant feedback. This type of use continued a behaviorist approach to language learning with its focus on stimulus – response, transfer of fixed content and routine as the key to successful performance. Learners are basically recipients of what the software has pre-determined in the form of content and learning paths (Murphy, 2000). There are two major designs; either pre-packaged material that could not be manipulated or modified by e.g. a teacher, or authoring packages that came in the form of generic task types (cloze tests, multiple choice, storyboards…) and required teachers to fill in the texts that were to form the basis for exercises (and sometimes modify task elements). The paradigm is in its essence instructional and structural, and close to Koschmann's (1996a) Computer Aided Instruction (CAI) with some of the more sophisticated software taking on Intelligent Tutoring System (ITS) characteristics. This model of CALL was often met with skepticism (Bush, 1997), partly as it appeared stiff and sterile with its

[75] In Karl Marx: Selected Works, vol. 2 (1942). Paraphrase of the opening sentences of The Eighteenth Brumaire of Louis Bonaparte (1852). The actual words were: "Hegel remarks somewhere that all great, world-historical facts and personages occur, as it were, twice. He has forgotten to add: the first time as tragedy, the second as farce."

focus on isolated utterances, partly because it was identified with leftovers from the Grammar – Translation and audio-lingual methods. However, with the advent of the World Wide Web, this paradigm has resurfaced online and sometimes with added interactivity afforded by programming in the form of e.g. Java and ActiveX has added flexibility. Internet access and the ability to meet differentiation needs have kept this paradigm alive.

3.7.3. Cognitive and constructivist approaches

Elizabeth Murphy (Murphy, 2000) has a slightly different grouping of paradigms, labeling cognitive and constructivist approaches *Communicative CALL*. However, this seems to be a too crude categorization that blurs some of the important developments in the field. Kern and Warschauer (2000) keep closer to Koshmann's categories when they identify a cognitive approach to CALL.

In this perspective, Seymour Papert's constructivist approach has a central role; agency is transferred to the learner who uses prior knowledge in order to acquire new insights. Technology is placed at the learner's disposal and not the other way round. Typical software would be word processors with in-built spell-checkers, grammar and syntax guides, bilingual dictionaries and outlining facilities. Using concordancers on digitized corpora in order to identify lexical patterns would also fall within this paradigm[76]. The inductive approach to formal aspects dominates, and communication and language production are promoted. Some games and simulations, "pedagogic software", also promote this view of language learning, sometimes adding 'intelligent response' based on a variety of possible learners' actions. However, as this approach roughly coincides with the advent of the stand-alone PC, it does not facilitate collaborative approaches, "the learner nevertheless acts in a principally consultative mode within a closed system, and does not engage in genuine negotiation of meaning" (Kern & Warschauer, 2000:10). Consequently, the learner, like the computer, is seen as a black box cognitively processing input in order to produce output at higher levels.

3.7.4. Sociocultural approaches

For a third paradigm, Elizabeth Murphy (2000, ch 2:15) makes a distinction based on characteristics of the technology more than an educational approach. Introducing the concept of TELL – Technology-Enhanced Language Learning – she distinguishes this from CALL since with TELL "the computer simultaneously becomes less visible yet more ubiquitous". While this notion of 'seamless' or integrative technology may be true, it is in the situated and collaborative aspects touched upon by Murphy (op.cit.:18) that paradigmatic features can be identified. For Murphy, constructivism, an integrative approach to ICTs, and an online environment make up the new paradigm.

Some of these elements are subsumed in the term *sociocognitive* by Kern and Warschauer (2000:4-5) who cite Dell Hymes and M.A.K. Halliday as key theorists for this approach. This sociocognitive position is characterized by viewing language "as a social *and* cognitive phenomenon", and reading and writing focusing "not only on individual learning strategies but *also* on helping learners become part of literate communities" (op.cit.:5 – 6, my emphasis). While this brings CALL closer to a sociocultural approach, the boundaries between cognitive and sociocultural perspectives become somewhat blurred in Kern and

[76] Corpus linguistics is not pursued in this study, and neither is computational linguistics. The latter is most often associated with artificial intelligence, parsing, and algorithms that can recognize and produce 'human' language. One of the more interesting aspects of this approach, and one which might well have potential for language learning, is in the development of 'chatterbots' – virtual entities that may emulate an interlocutor. They can be used online or downloaded. For an overview and introduction see <http://www.botspot.com>

Warschauer's description. The emphasized conjunctions in the quotes above point to a social approach being *added* to a basically cognitive approach. In the Vygotskian tradition, a social plane would be a *prerequisite* for individual cognition. While the authors obviously point to salient trends in CALL, there is no reference to the growing insights resulting from the CSCL tradition. Research literature on sociocultural CALL is, however, still sparse, including CSCL publications, although some is emerging (Debski et al., 1997; Warschauer, 1997; Zähner, Fauverge, & Wong, 2000).

Koschmann's four paradigms (cf Chapter 3.6.1 above) are important in order to understand the development of CALL. The CSCL paradigm parts with the others in its emphasis on collaborative approaches to learning and how ICTs are embedded in social processes. In its theoretical framework it shares many of the sociocultural assumptions. As such, CSCL transcends earlier paradigms of ICTs that view ICTs as basically either transfer oriented or as cognitive aides. Where other models tend to address technologies and users as separate entities, CSCL addresses activities constituted by the interplay of technologies, users and contexts. However, the present researcher would add that studies have often focused on CSCL *technologies*, addressed *generic* learning processes (e.g. concept formation, types of interaction) and less often what happens when a particular *school subject* or knowledge domain is introduced. Under the umbrella term of CALL, CSCL has recently begun to make an impact although this is still in embryonic form and so far without the considerable theoretical debate that accompanies the development of CSCL (Debski et al., 1997; Warschauer & Kern, 2000).

Carol A. Chapelle (2000:217) summarizes at the turn of the century: "Relatively little work has been done so far to probe questions about the sociocultural and classroom contexts of CALL use", and she goes on to identify network-based language teaching as critical in the evolution of CALL research. As for future practices, Chapelle focuses on the tasks that materialize in the wake of networks and how these can be beneficial for language learning. However, her interpretation of the state of CALL is challenged by Rafael Salaberry (1999:104): "For, instance, the recent appearance of a substantial number of theoretical and empirical studies of the analysis of L2 classroom interaction from the perspective of sociocultural theory has not been incorporated to Chapelle's analysis". He emphasizes how a sociocultural perspective "provides a contrast with strictly information-processing approaches" (op.cit.), which he finds in Chapelle's "machine-human interaction as opposed to human-human interaction implemented in CMC activities" (op.cit.:105). This view is also expressed by Kramsch and Thorne who make the connection between technologies and views of language:

> *(…) network technologies have helped to initiate a significant pedagogical shift, moving many language arts educators from cognitivist assumptions about knowledge and learning as a brain phenomenon, to contextual, collaborative, and social-interactive approaches to language development and activity (Kramsch & Thorne, 2001:86).*

The above quote is, in many ways, the theoretical framework in Chapter 2 applied to language learning. Such is the situation at the time of writing this study. While there is still a strong tradition of CALL addressing *materials* (Cameron, 1999), software packages and technologies that aid and promote cognitive development and linguistic performance, there is a growing attention to how technologies are embedded in larger social and cultural practices. CALL simply cannot escape such perspectives unless it wants to end up as a backwater

phenomenon[77]. As the impact from sociocultural studies of language learning on the one hand, and the trend towards collaborative uses of ICTs on the other, adding the rapidly developing technologies on top, questions of how teachers and learners can cope become acute. However, before discussing the didactic implications for teachers who take up ICTs in their practices, one most crucial aspect of technologies in (language) learning must be addressed; their impact on the notion of *literacy*.

3.8. Multiliteracies

3.8.1. Literacy and Multiliteracies

Learners and teachers are today facing the challenge presented by *multiliteracies*. With multiliteracies, learners can be prepared for the future and not just for the literacy of the print era[78]. According to Warschauer (1999:14), "the technocratic paradigm of literacy that emerged after World War II continues to dominate today. Literacy is viewed as a series of discrete functional skills that can be taught from isolated technocratic methods". This functional view of literacy has fitted a basically tutorial and mechanistic paradigm of CALL. As communication modi (text, sound, graphics) have increasingly become digitized, can (thus) be manipulated, have converged in multimedia, and as these forms have become networked and globalized across time, space and cultures the notion of literacy changes fundamentally to "socially made forms of representing and communicating" (Kress, 2000:157). Traditionally reserved for alphabetical competence (and sometimes numerical, *numeracy*), 21st century literacy encompasses language, culture, power, and technologies and takes on the form of *multiliteracies* (Cope & Kalantzis, 2000) or *flexible literacies* (R. Edwards et al., 2002). Soetart and Bonamie add "a multidisciplinary and interdisciplinary shift in the academic world", and conclude that "the digitalisation of all communication and information unites all these literacies on the computer screen" (Soetaert & Bonamie, 1999:126). As the changing notion of literacy is such a vast topic, the present chapter will confine its focus to the extended notion of multiliteracies with a view to what this means for EFL and ICTs. In the final pages of the present chapter, multiliteracies will be revisited as a possible direction for didactics.

3.8.2. Discourse communities

First, it is important to emphasize that literacy is to be understood as "social practices with an intricate relationship to the technologies of which they are a part; that is, they are shaped by and shape one another" (Lea & Nicoll, 2002a:8). Technology is not just a component in an educational setting and literacy is not a decontextualized skill. In this perspective, computer literacy is not a single competence but implicates diverse and changing contexts in which computers are put to use.

To make such relationships visible to learners is a didactic task. In Chapter 6 on Classroom Encounters, we see how learners and teachers read and write in hypertextual mode, conduct online searches, evaluate material, communicate in new channels, new genres, new linguistic conventions, and engage in networked interaction across barriers of space, time and cultures.

[77] Indeed, the term CALL may already be obsolete. There is no parallel in e.g. Computer-Assisted Natural Science or Computer-Assisted Aesthetic Subjects.

[78] To what extent teachers are appropriating changing literacies is an open question. A British study found that student teachers embraced a broader concept of literacy and that to them electronic text "does not supplant print culture but it changes it". On the other hand, some teachers were "literally ignorant" due to "an appalling lack of in-service training" (Goodwyn et al., 1997: 238-39).

These attempts are all illustrations of how multiliteracies, and in this case especially electronic literacies (Shetzer & Warschauer, 2000:177), make their mark on EFL classrooms.

Second, in the case of language learning, a Norwegian learner of English becomes literate in that particular discourse by gradually entering the discourse communities (and they are many and diverse!) of that language. As was discussed in Chapter 3.5.2 above, the claim is that this takes place primarily through socialization or enculturation by engaging in authentic and meaningful exchange. According to van Lier (2001)[79], acquisition of decontextualized skills gives way for an organic view of linguistics and language learning where formal conventions (register, grammar) are tied to active and functional language use. "Once literacy is understood as a complex social practice, literacy instruction is viewed as apprenticing students into the discourses and social practices of literate communities" (Warschauer, 1997:3).

3.8.3. Implications

Because of its complex nature and because it is constitutive of didactic practice (cf Chapter 3.9 below), the construct of multiliteracies needs to be delimited. Judging by literature on the topic, most scholars seem to use the term as in the seminal work by The New London Group (2000) and the subsequent edited volume that brings together texts that expand on the construct:

> *'Multiliteracies' – a word we chose because it describes two important arguments we might have with the emerging cultural, institutional, and global order. The first argument engages with the multiplicity of communication channels and media; the second with the increasing salience of cultural and linguistic diversity (Cope & Kalantzis, 2000b).*

With their focus on globalization, diversity, and technology The New London Group aims at establishing multiliteracies as a counterforce to market logic and untamed liberalism:

> *In this way, just as global geopolitics have fundamentally shifted, so has the role of schools. Cultural and linguistic diversity is now a central and critical issue and, as a result, the meaning of literacy pedagogy has changed as well. Local diversity and global connectedness mean not only that there can be no standard; they also mean that the most important skill students need to learn is to negotiate regional, ethnic, or class-based dialectics; variations in register that occur according to social context; hybrid cross-cultural discourses; the code switching often to be found within a text among different languages, dialects, or registers; different visual and iconic meanings; and variations in the gestural relationships among people, language and material objects. Indeed, this is the only hope for averting catastrophic conflicts about identities and spaces that now seem ever ready to flare up (New London Group, 2000:14).*

This is quite a dramatic statement and one that places the ability to negotiate across differences at the heart of literacy as a condition for learning in a diverse and sometimes antagonistic world. Moreover, this involves a significant extension of people's literate repertoires. (For instance, implications for our understandings of reading and writing in light of cultures and technologies transcend merely encoding and decoding of text, and deserve a separate study). It also involves the ability to be prepared for the non-standardized, the uncommon and the unexpected, all parts of an epistemological shift that targets pluralism and change instead of a fixed and stable subject matter. "The complex communicative practices

[79] Van Lier writes about foreign and second language in general, but his views are especially relevant for the field of changing English(es).

which are put into focus within the Multiliteracies Project constitute heavy demands on the communicative abilities of people" (Fairclough, 2000). In many ways, the notion of multiliteracies captures exactly what has previously been described regarding global and online Englishes and the transformed communication practices brought about by diverse technologies, from the short message service (SMS) of the cell phone to the multimedia affordances of broadband networks, powerful hardware and sophisticated software.

The New London Group offers a sociocultural perspective of literacy, i.e. skills are never context-free; "reading and writing can be understood and acquired only within the context of the social, cultural, political, economic and historical practices to which they are integral (Lankshear et al., 2000:28). The EFL community - as it has been described in the present chapter as global, multicultural, technology-infused, and dynamic - is one example of how multiliteracies are needed in order to make sense of and exert agency on it. How learners can be 'apprenticed' into this particular discourse and how teachers can assist in such processes are currently questions with only tentative responses. How such processes can be operationalized, made visible, are questions of a didactic nature, and will be pursued in the following sub-chapter.

3.9. Didactics

3.9.1. Didactics as social practice

Teaching a foreign language is a social and cultural practice. It requires fellow humans in order to manifest itself and when it does it employs artifacts in the form of signs, symbols, and material tools. Also, teaching is conducted at a particular time, under the influence of policies, affordances and constraints found in settings and tools and the 'semiotic budget' available in the historical and contemporary variants of the language(s) used. No element is invariable. Teaching in the 21st century takes place in a complex and composite field (as shown in the present chapter) and the social organization of this type of practice needs to be examined.

In a sociocultural perspective teaching is, thus, inseparably intertwined with learning, tools and artifacts. Consequently, the present study argues that didactics (cf Chapter 3.9.2 for interpretations of the term) must be seen as an educational constituent that cannot be separated from the practices it is a part of. The implication is that didactics, like the school subject in question, the teacher(s) and learner(s) involved and the context for the activity are subsumed under and will be sought understood in a sociocultural perspective. Such a perspective allows for multiple levels of description while focusing on the interrelations of levels involved. Central to the activity is knowledge construction. This is an activity that is planned, enacted, and evaluated, and with the teacher participating on all levels. Through knowledge construction a teacher becomes a co-worker and co-constructor, although with more expertise or 'mature social practice' (Lankshear et al., 2000) to invest. Didactics is not primarily planning or seeing the world through a particular subject but a social practice in which knowledge construction can be made visible. Also, didactics can hardly be separated from our conception of knowledge. Such a separation will reduce didactics to a series of techniques applied to *any* assumption of what knowledge is and the epistemological implications.

Admittedly, a sociocultural approach to didactics is not commonly found in literature on the subject, although there are exceptions (Edwards, 2001; A. Edwards et al., 2002; Leach & Moon, 1999). The field of didactics seen through a sociocultural lens seems (at the time of

writing) to be insufficiently examined but (at least to the present researcher) to hold promise for a reorientation of didactics that is more aligned with research into classroom practices.

Along with EFL and ICTs, then, didactics is the third component of the composite field in which teachers navigate and develop their social practices. Only a few aspects of didactics will be touched upon in this section; the *Bildung* tradition, subject content, and teachers' professional knowledge. These aspects of didactics will be sought related to school subject and technologies, and a direction for didactics in a sociocultural perspective will be suggested.

But first, the term itself needs clarification as "this term and the adjective form 'didactic' until today has been the subject of a great number of widely or narrowly framed interpretations/definitions" (Klafki, 2001:109, my translation).

3.9.2. A slippery term

As was noted when the term *didactics* was first introduced (cf Chapter 1.1), the word may be associated with a normative, deictic, approach. To some it may carry negative connotations and it may be used derogatively in some educational milieus. Leach and Moon (1999:265) note that, "Whereas pedagogy and didactics are the cornerstones of other mainstream European schools of thought, the term has been infrequently used either in Britain or in North America". The authors point to historical reasons; the two latter countries have not appropriated the tradition spanning from Comenius via Pestalozzi to Herbart. The private and élitist school tradition rejecting the science of teaching is given as another reason, and differences in estimating the value of particular knowledge domains is suggested as a third. Without pursuing this discussion[80], the term *didactics* will be used in the present sub-chapter, but devoid of its etymological implications of deixis and normative overtones. These have led to the fact that "didactics has a negative valuation in the Anglo-American mind. It denotes formalist educational practices that combine 'dogma' with 'dullness'" (Hamilton, 1999:135).

Also, and at the risk of doing some scholars injustice, the term *didactics* will in the following be used where others may have used the term *pedagogy*, the difference is not always obvious. This is particularly foul water when navigating between (mostly) European and Anglo-American traditions and research communities. It is rare to encounter the term *didactics* in indices of Anglo-American educational literature; *pedagogy* seems to have subsumed the concept. This is also argued by David Hamilton, who calls it a paradox that, "The European discourse of didactics is, I suggest, very close to the Anglo-American discourse of pedagogics. Only their language divides them" (op.cit.:135).

A third difficulty is found in the way didactics is used indiscriminately about phenomena ranging from accumulated, tangible, hands-on teaching techniques on the one hand and the European *Bildung* (Norwegian: *dannelse*) tradition with its focus on personal growth and cultural refinement – formation – on the other. On this basis, some might even contest the claim that didactics constitutes a separate discipline (Wiggen, 1996 discusses this aspect). The concept has tended to be suspended between very different interpretations. The present account concurs with Hokstad (2002) who argues, "didactics [is] a crucial discipline and a distinct perspective that will enrich our understanding of the unique field emerging under the somewhat imprecise label, 'ICT and learning'". However, if such a perspective is to be distinctive, and not just a technical coating on any approach to a school subject, or a generic

[80] David Hamilton has an extensive discussion on the historical roots of pedagogy and didactics as well as how the Anglo-American and mainland European tradition have come to regard the concepts (Hamilton, 1999).

comment on formational aspects – *Bildung* – it needs to be refined in the light of learning theory as well as the fundamental changes that take place in subject matter and educational approaches to it. This involves didactics taking a theoretical stand, an epistemological position, and developing a concept of knowledge. However, these aspects are not always to the fore in literature on didactics.

Didactics is often understood in the wide sense as the "theory and practice of teaching and learning" (Gundem, 1998:7,14; Jank & Meyer, 1997:18), or where theoretical research meets a practical and discursive level (Hokstad, 2002:209). Karsten Schnack (1993:7, my translation) observes that "didactics is thus pedagogic reflection in which the dimension of planning is essential" and that "Didactics is (...) about the content of formation", including education for disobedience (op.cit.:16, my translation).

S*ubject* didactics (*Fachdidaktik* in the German tradition) is understood as,

> *(…) all the reflections applied to a subject and the teaching of this subject, which can give increased knowledge about the nature of the subject, about the legitimacy of the subject and increased knowledge about how the subject can be learned, taught and developed (Lorentzen, 1998:9, my translation).*

This definition is echoed in Simensen's book on principles of foreign language teaching (1998:9) with its emphasis on *what*, *how* and *why* to teach, often seen as the heart of didactics. How the emphasis between these three items have shifted, will be discussed later in this chapter (cf Chapter 3.9.4). However, the above definitions do not fully address the relational aspects of didactics. In this respect, Daniels' (2001:4) definition would be closer to a sociocultural perspective: "Didactics – the study of the relationship between pupils, teachers and the various branches of knowledge grouped into educational subjects".

These definitions (and there are numerous others)[81] capture various facets of the nature of didactics. However, when didactics is explored in light of technological and social aspects, dimensions of knowledge transformation, epistemologies, and identities become crucial. For this purpose, the present study adopts a working definition that is, perhaps, slightly less elaborate but comprehensive, dynamic and concrete at the same time: "Didactics is 'to make visible'" (Hokstad, 2002:209, my translation). With ICTs, thought and language (to paraphrase Vygotsky) as well as relations between learners, teachers and subject, can be made visible to an extent that teachers and learners have not experienced before (se e.g. teacher Tom's work with online discussions in chapter 6.4.5). It follows that a subject didactics is to make content visible including its historical, current, and future status, and our relations to it; in other words, to be initiated into and participate in a culture through a (school) subject. Peter Menck addresses this issue by way of a question: "*What kind of image of the world is produced in the work done in the classroom, the image we expect the pupils to adopt as their own?*" (Menck, 1999:122, emphasis in original). Such issues become even more essential in light of networked, dynamic, virtual and unpredictable contexts where learners' empowerment increases through their access to ICTs. But with empowerment come opportunities as well as responsibilities. Consequently, the (mostly) German concept of *Bildung* as a crucial element in didactics calls for some consideration.

[81] Bjørg B. Gundem gives a precise overview of the history and various definitions of didactics (Gundem, 1998).

3.9.3. The *Bildung* tradition[82]

The European *Bildung*-tradition, especially as developed by Wolfgang Klafki (1998; 2001), has become an influential force in issues of teaching and learning. In Europe, Klafki in many ways personifies the discipline of general didactics (not so much subject didactics) as "dialectic, in the sense that formation is an expression of human development in constant interaction with natural and cultural context" (Nabe-Nielsen, 2001:14, my translation). Klafki's development of critical-constructive didactics revives classical ideals linked to democratic values: Education is for all, regardless of class, nation, and population, education is universal in the sense that it involves heads, hands and hearts, and education addresses imperative current issues such as maintaining peace and an ecologically sound world, preventing injustice, economic inequality and hunger, and it takes a critical approach to the new digital and networked media. This view of didactics carries normative qualities, and Michael Uljens (1997:10) observes that this is where the German tradition parts with the more descriptive Nordic didactic tradition: "This difference between Nordic and German pedagogy regarding normativity clearly shows that theories of didactics are grounded in culture and history, i.e. they are regional and not universal".

To Klafki, formation is "defined by the following terms: *self-determination, freedom, emancipation, autonomy, authority, reason, self-activation*. Hence, formation is always understood as the ability of self-determination" (2001:31, my translation, emphasis in original) or, in the words of Peter Menck (1999:116) in his discussion of Klafki, "what makes humans human". There are strong elements of literacies as well as the formation of identities implicit in Klafki's concept of *Bildung*. What learners should know about a particular subject is overshadowed by the concern for what learners should become. This is a line of thought that connects with fundamental issues in sociocultural perspectives on learning and teaching; how we are transformed by and transform social contexts, how individual and collective, current action and histories are all interwoven. To Klafki, the individual is mediated by her cultural history (1998).

A close reading of Klafki finds elements that can be subsumed under constructivist as well as sociocultural perspectives; it is difficult to pin down any declaration of learning theory. Where Klafki comes close to sociocultural perspectives is in his discussion of didactics in a historical-hermeneutical perspective, "as a science *about* praxis to be *used in* praxis" (2001:119, my translation, emphasis in original). Under which historical circumstances teachers and learners act is decisive for their preferences. Moreover, didactics is expressed in concrete interactions, in social relations and implicit rules of institutions (op.cit.:120), and a didactic document is embedded in a social context, hence carrying ideologies and interests (op.cit.:134). Klafki describes the interaction of learners and teachers as processes where

> *teaching is always a* social process. *In teaching is incorporated - mediated by teachers' and learners' inherent biographies, which are always individual biographies in specific social contexts – different social observations, prejudice, actions, and attitudes that are reinforced, become habits, are suppressed or changed, lead to conflicts and obstacles, contact and compromise, possession or resistance (op.cit.:146, my translation, emphasis in original).*

[82] The German term *Bildung* equals a process of personal formation in interplay with a democratic society, "cultivation of humanity in the individual by acquisition of those attributes in which humanity is objectively manifested (Menck, 1999:119), or "the process and product of personal development guided by reason" (Gundem, 1998:29). As the term has no 'official' counterpart in the English language that captures the essence of the term, the German term is used in this study. This is in line with prevailing practice in literature on didactics.

These biographies include experience from in- as well as out-of-school contexts, a view that is found in The New London Group's concept of multiliteracies under the term *lifeworld* (see above) as well as in other socioculturally-oriented studies of learner trajectories (Lankshear et al., 2000; Thorne, 2000a). However, for Klafki one issue remains to be clarified; to what extent conditions for "social learning processes" on the one hand and "subject-oriented learning processes" on the other are identical (2001:150). This goes to show that Klafki's sociocultural orientation stops short of a true ecological view of the learning processes and seeing activity as a unit of analysis that bridges the individual and the social. Finally in a study of *performance* (op.cit.:239-282) this concept is consistently treated as a social construction, dependent on its historical and cultural context and where "performance can never have complete meaning in itself. Performance must be understood and practiced as a dialectic concept" (op.cit.:277).

The point (and more examples could be added) is not to 'prove' that Klafki's is a sociocultural perspective. There is no theoretical foundation that qualifies such a conclusion. But there are obviously elements in Klafki's critical-constructive approach that can prove fruitful when teachers try to make sense of a volatile situation where epistemologies change, the school subject is in flux, and technologies upset the traditional structures of power. In such a situation, teachers' didactic expertise including the *Bildung* dimension is called for, not just instrumental, methodological, or managerial skills. As researchers of education increasingly address *transformation* of knowledge and identity as core concepts for the 21st century (Edwards, 2001; Gee, 2000; Kalantzis & Cope, 2000a; McCormick & Scrimshaw, 2001), Klafki's critical-constructive didactics might provide conceptual tools for these efforts.

Having tried to capture some of the essence of *Bildung* in didactics, the next step is to see how didactics can be made visible through a particular discipline or school subject when it becomes increasingly steeped in networked technologies.

3.9.4. 'What, how, why', and 'where, when'

Foreign language didactics have often been referred to as the answers to *what* are the content and objectives of a course, *how* should this be dealt with, organized and evaluated, and *why* just these issues (Simensen, 1998:9). However, emphasis on each of the three components has shifted since the early 1900s (Gundem, 1998; Wiggen, 1996). From having focused on the *what*, the selected educational representation of a science and what was worth teaching, the 1960s saw a shift towards the *how*. Based on theories of learning and developmental psychology, teaching methods gained interest. So did educational technologies, e.g. in the form of the language laboratory. In the 1970s, the critical didactics of the Frankfurter school argued that more important was the *why* of didactics and addressed issues such as emancipatory perspectives, personal and societal development. Klafki's contributions can be assigned to this trend. As the 20th century ebbed, this turn towards political and ideological foundations for subjects brought back renewed interest in the *what*, the content related to larger issues. Reflection on educational practices became more pronounced as the focus for didactics.

As with approaches to language learning and teaching, approaches to didactic uses of ICTs seem to move through phases that rehearse this simplified history. Right from the initial phase in the 1970s and 1980s the quest for a particular 'ICT-didactics' began. This continued over the years, often with literature that highlighted the technicalities of the programs involved, the possible value added by ICTs, and examples of use (Brierly & Kemble, 1991; Cameron, 1989; Hardisty & Windeatt, 1989). Typically, a volume on teaching with computers focused on

computer program code (BASIC) in order for teachers to make and use drills, repetition, and matching tasks, although the final section expanded the perspective to "Non-instructional applications" such as word processors (Kenning & Kenning, 1983). In Norway, such efforts were largely carried by research and development, including courses for teachers, under the auspices of the Norwegian Data Secretariat. For example, how to develop and exploit computer simulations to target complex, cross-curricular problems and their possible solutions became a field of sustained interest (Myrtveit & Vavik, 1987). However, this work met with financial problems and (consequently) legitimacy problems. Also, it soon became apparent that no such concept as 'ICT didactics' was viable. Kern and Warschauer, summing up networked language teaching makes this clear:

> *Network-based language teaching does not represent a particular technique, method or approach. It is a constellation in which students communicate via computer networks and interpret and construct on-line texts and multimedia documents, all as part of a process of steadily increasing engagement of new discourse communities (Kern & Warschauer, 2000:17).*

As more applications and 'pedagogic software' emerged in the 80s and 90s, attention shifted to content. Also, the emergence of the World Wide Web in the 90s resulted in access to innumerable sources of information that were felt to be new and 'authentic' (i.e. not adapted) in the classroom. However, it soon became evident that much software fell short of expectations or merely repackaged old routines in digital wrapping while the WWW proved to be a source of highly debatable content, spurring a series of guidebooks for teachers (Sperling, 1997 is a typical example for teachers of English). A critical approach to content was accompanied by books that sought to guide teachers in the choices they made (Bakke & Millar, 2000; Harboe, 1999 are Norwegian examples relevant for CALL).

The *why* dimension has continued to gain interest throughout the 90s and into the new millennium, as digital technologies change epistemologies and content and challenge time-honored methods and classroom management (Leask, 2001). However, it is not only an expression of a critical approach but a deep-seated concern about how ICTs can be made to convey higher-order skills, insights and knowledge that are the product of reflective practices. Moreover, with electronic networks, two additional dimensions enter the concept of didactics: *when* and *where*. Such temporal and spatial dimensions add new levels to the educational activity and, consequently, greater complexity.

With networked technologies gaining ground in the 90s, language learning and teaching could now exploit a plethora of multimedia applications in collaborative settings. What is more, they made it possible to transcend constraints of time, place and culture. Besides, with these restrictions suspended, it is possible to go beyond the interaction between learners and technology and into networked social interaction both synchronously and asynchronously. This is happening at a rapid pace with sophisticated software and broadband connections as driving forces. The result is that learners, teachers and technologies position themselves in a number of configurations and that, consequently, didactics becomes increasingly a matter of *relations* (cf Daniels' definition in Chapter 3.9.2). How such relations can be designed and made to serve educational goals might well turn out to be one of the major challenges for teachers. This issue will be pursued in the concluding section of the present chapter.

3.9.5. School subject and 'reality'

A school subject is in many ways a poor, reduced representation of the subject as it unfolds in the 'real world'. Reduced to a fixed number of lessons, framed in a curriculum and syllabus

list, adapted through textbooks and other teaching materials, it has been conveyed and quality controlled by a string of educators from policy makers to textbook authors and the teacher of the subject. In other words, the classroom variant of a subject is a social construction shaped by historical-cultural ideologies, policies, and power structures. In the case of EFL, it is evident how its existence and function cannot be seen separate of its hegemonic and imperialist roots (Crystal, 1998). At the same time, it is important for the socio-economic future of Norway to have workers and academics that are proficient in English.

In the classroom, such macro-contexts are reduced. The subject of EFL is given partly in its focus on the four skills, partly in contextual factors like e.g. expressed in the curriculum for the foundation course in upper secondary school targeting historical, geographical, and social conditions including values in the UK and US. The vast subject matter is shaped or 'coded' in texts, pictures, tapes and videos etc. that refer to the enormous complexity encountered outside the school gates: "In other words, *in the classroom the presentation of reality is exclusively coded in the language of various symbolic systems*" (Menck, 1999:118, emphasis in original).

This changes dramatically with the advent of digital networks. As seen in Chapter 3.3 above, the English language itself is undergoing considerable change as is our understanding of what it means to be literate. The consequence for classroom work is that focus shifts from digesting and negotiating pre-packaged subject matter to interpreting what goes on as learners and teachers constantly encounter non-coded (in the classroom sense) material and discourse. Such a situation calls for what Peter Menck refers to as "*the didactic construction of reality*" (op.cit.:121, emphasis in original). The question is which image or version of reality is constructed. This immensely complex process requires a notion of *Bildung* along with the expertise required to make such processes visible. In Chapter 6 on classroom encounters, teachers are put to such tests and their 'didactic moves' are analyzed. The following section takes a closer look at teachers' knowledge as a resource in such construction.

3.9.6. Teachers' professional knowledge

One of the assertions that emerges from the present study is that teachers' *expertise* is a crucial – perhaps *the* most important (see e.g. Zhao, 2002) – factor in a sustainable information ecology (cf chapter 6 for illustrations). A study by The British Educational Communications and Technology Agency (BECTA) found that "When teachers disengage from the use of technology and leave pupils to use it and teach each other how to use it, the potential for enhancing learning drops away steeply" (Dawes, 2001:64 - 65). Teachers' ability to work as the more knowledgeable peer in technology-intense settings is becoming an integral part of their professionalism. However, what counts as expertise may not be obvious.

In the present study, a 'teacher as facilitator' model is rejected as being inadequate and not helpful in understanding how interactions conducive to learning can be fostered in technology-rich settings. On the contrary, this study argues that in the wake of pedagogic and technical development, the distributed and mediated character of knowledge, subjects undergoing radical change etc, a complex assemblage of expertise is needed. However, this is not expertise in the form of a state but as an activity of coming to know through participating in educational practices. As our concepts of knowledge and epistemology change, teachers are challenged to make such processes visible in the classroom so that learners can gradually become literate and can take part in diverse social practices in 'mature' ways (Lankshear et al., 2000). For teachers to make such processes visible, they have to acknowledge how they, too, are learning as they are transformed through activities.

Teacher knowledge is constantly evolving in practices and is not a compilation of subject knowledge and managerial skills to be applied to a classroom situation. Rather, teacher knowledge is a multifaceted, evolving understanding of how three dimensions interact; *subject knowledge, school knowledge* (which is the curricular version of the subject as it appears in full in 'reality'[83]), and *pedagogic knowledge*. Together, these dimensions add up to teachers' professional knowledge. A model of how these dimensions interrelate is devised by Banks et al. (1999) and is also used by McCormick and Scrimshaw (2001) where they apply it to analyze change in practices as a result of ICT implementation: "An exploration of teacher knowledge is necessary in order to indicate the way in which teachers need to change, which has implications for implementation strategies" (op.cit.:40). As their model of didactics (the authors use the word 'pedagogy') is based on a quite sophisticated notion of change and transformation, it is used here as an analytical tool for getting closer to teachers' professional expertise and what this concept means in technology-rich settings.

The three components in the model each address dimensions of teachers' professional identities. Together they form the teacher's personal construct of what counts as good teaching and valuable knowledge about a subject. This construct is an extension of a teacher's experience and life world. Figure 3.1 represents a possible model of teachers' knowledge in relation to the subject of EFL. It is a model that sees knowledge and learning as situated, and teachers as working at the interface of several dimensions. Each of the dimensions is never stable or fixed, but subject to change, as e.g. the case of the subject, English, as well as theoretical frameworks, socio-political expectations etc.

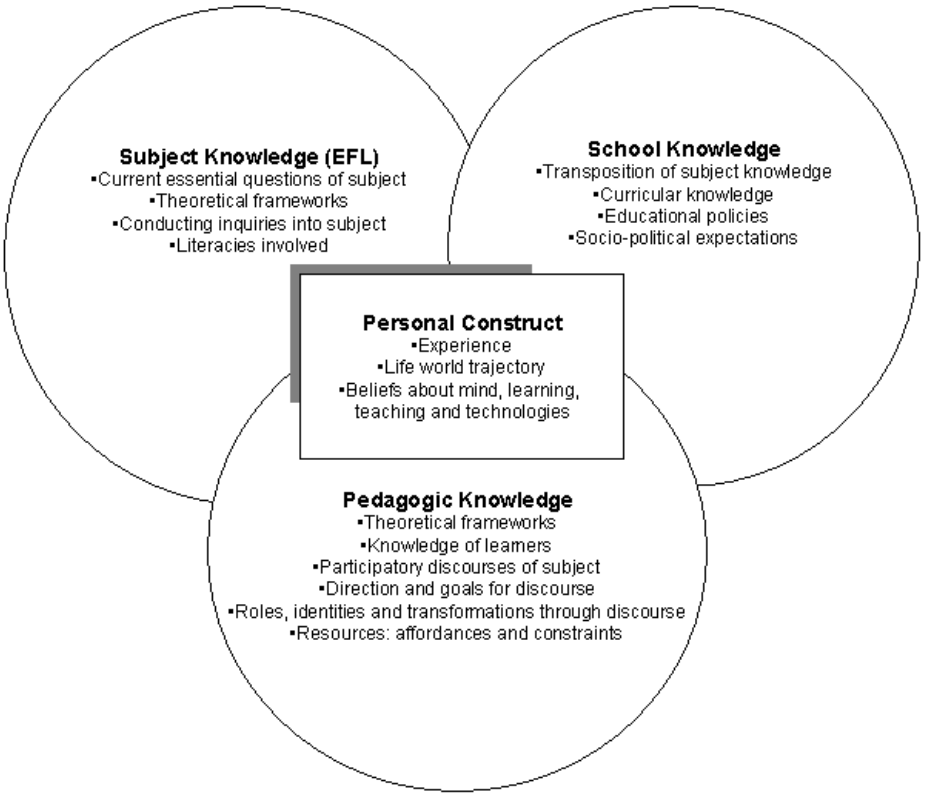

Figure 3.1: Dimensions of teachers' professional knowledge. Adapted from Banks et al. (1999) and McCormick and Scrimshaw (2001).

[83] For example, in the case of English the Norwegian curriculum for the foundation course in senior high school delimits the 'school knowledge' of the subject to the four skills at a particular level and some assorted goals that address historical, social, and cultural issues in the (mostly) Anglo-American world.

When ICTs are integrated, teachers' professional expertise experiences several jolts. The nature of the subject may change, as is the case with EFL. What counts as knowledge becomes open to discussion and its distributed nature demands that it must be appropriated and constructed in ways that are not yet well-established in the educational system. Also, ICTs are integrated partly from a position of subject knowledge (e.g. demands from English practiced in a global and networked world), partly from a position of school knowledge (e.g. demands from policy makers), and partly from a position of pedagogic knowledge (e.g. how teachers situate ICTs in their classroom practices). The result is three discourses that are not always aligned, but may represent tensions and even contradictions.

Also, technologies are changed as they are put into use by learners and teachers with different intentions and, which in turn, may be different from those of policy makers and at administrative levels. Diverse perspectives are brought into technologies according to the contexts in which they are situated; there are different 'cultures-of-use' (Thorne, 2002a). Technologies reflect accumulated insights of the cultures and communities they have been developed and used in, and that is why didactics cannot point to de-contextualized, universally valid uses of them. They must be adapted to the discourse they enter into.

When teachers try to integrate ICTs into the dimension of school knowledge, there is no guarantee that this dimension with its historical and cultural heritage allows for the changes emerging in the other dimensions and in other discourses or 'cultures-of-use'. A reading of Norwegian policy papers (including curricula) shows that the perspectives found in these to very little extent echo the approach to didactics and ICTs debated in the present chapter. Consequently, teachers themselves often become the most important agents of change, they become "Gateway to society's distributed knowledge" (Draper, 1998:4) on a subject. In order to make this role more visible, it is necessary to re-examine the changes that the field of didactics faces and how teachers can design learning environments and activities that have change, or transformation, as one of its core elements. This involves working with complexities far greater than those found in strictly curriculum-oriented teaching. For teachers, it means constantly being sensitive to the 'teachable moment', for serendipity, for moments when learning and teaching conflate in joint construction of new insights. This is part of the pedagogic knowledge teachers may bring to schools and classrooms, to the proximal zones of development that include learners as well as teachers. However, this does not mean that teacher intervention, classroom management, and instruction disappear. In learning situations characterized by uncertainty, complexity, and instability, teachers and their designs for learning become the primary scaffolding for development (Edwards, 2001; A. Edwards et al., 2002).

3.10. Convergence of teaching and learning: joint scripts

We have seen that the subject in question, EFL, is undergoing great change, partly because of its globalization and partly because of its transformation through ICTs. These dynamics result in a wider gap between the English as a standardized school discourse and variants found outside of schools. Mediating between different discourses increasingly becomes a teacher's didactic task. In addition, ICTs develop at such a speed that it is extremely difficult to make an educated guess about their role in an educational future[84]. To *didacticize* a subject (Hertzberg, 1999) under such circumstances, places teachers in an exceptionally complex,

[84] A fascinating description of a possible future is provided by Ray Kurzweil (1999), although he discusses the power and potential of technologies more than the social and educational implications.

uncertain, and demanding situation. It means working at the interfaces of literacies, technologies, the official script for the school subject (curriculum) and the subject as it appears to the learners in 'real life'. Out of this complexity a teacher tries to contextualize and situate a school subject so that it relates to the learner's lifeworld. Chapter 6 illustrates this situation.

One consequence of the dynamics involved is that teachers become learners along with their own pupils, although these learner roles are not identical, formed as they are by the different lifeworlds involved. This is also supported by findings from research on teachers integrating ICTs:

> *Competent teachers (…) liked the challenge and the new perspectives that the new teaching and learning contexts made possible. They put themselves in a learning environment, willing to create a better relational and cognitive context, more motivating to themselves and to the pupils (Gobbo & Girardi, 2001:75).*

In fact, many teachers experience being assisted by their learners, although mostly on a strictly instrumental level. Thus, we may see the distinctions between teaching and learning becoming blurred or even obliterated. This is in itself an important point that has consequences for didactics. Moreover, within a sociocultural perspective on literacy, teachers must themselves belong to the environment their learners try to negotiate and make meaning of, "Teachers who are not themselves members of the club cannot sign pupils up for it" (Hertzberg, 1999:37 quoting Smith, my translation). In order to apprentice learners into meaningful practices in networked environments, teachers must themselves be skilled negotiators of such environments. In other words, how can teachers take part in electronically mediated discourses if they are not familiar with hypertext, do not write emails, chat, inhabit discussion lists, navigate multimedia and traverse the World Wide Web? It could also be argued that e.g. in-service training would benefit more by providing opportunities for analyzing learner practices – including their own – than providing the hands-on experience of a particular type of software.

Traditionally, one difficulty of approaching teaching and learning as a unit is the lack of a term that includes both aspects. The dichotomy in terms has continued to obstruct a concept of knowledge that views the two as dimensions of a communal activity. Within theories of learning, the sociocultural perspective suspends this dichotomy since its main unit of analysis – activity – represents a level of description that subsumes the pair. But in didactics the binary level of description has continued to be a problem. For instance, Klafki (2001:110, my translation) notes that, "In the following I put the terms 'teaching' ('Lehren') and 'learning' ('Lernen') in inverted commas because there does not exist any universal and jointly understood concept". What Klafki misses is an articulated concept of knowledge that incorporates the two dimensions. This is elaborated in several of his studies, e.g. when he describes "critical constructive didactics as an interaction process, as a mutual relation between teachers and learners as well as among the learners themselves" (op.cit.:146). The same point is made in his discussion of the planning dimension of teaching, but adding that, "teachers, too, (…) constantly go through their own learning processes through interaction with the pupils" (op.cit.:287).

Other researchers have also argued for the deconstruction of the teach-learn dichotomy. T.J. Shuell examines the relationship between teaching and learning from an integrative perspective summing up that historically, two different traditions have been involved:

> *research on learning is usually conducted in departments of educational psychology (...), whereas research on teaching is usually conducted in departments of curriculum and instruction. Unfortunately, there is often far too little contact between researchers concerned with the two topics (Shuell, 1993:294).*

Shuell goes on to describe and analyze research on and concepts of learning and teaching, observing that "For the most part, however, process-product research focused on student outcomes rather than student learning" (op.cit.:297). When turning to the role of the teacher, Shuell acknowledges that teaching is likely to involve some sort of intervention from the teacher, but that there are different types:

> *(a) providing relevant content, including specific knowledge and learning tasks; (b) eliciting various psychological processes, both cognitive and affective; (c) providing cues as to what is most important in the material being learned and in the manner in which it can be processed; (d) encouraging motivation; and (e) relating to students in personal ways that affect their feelings of self-efficacy, personal goals, and so forth* (op.cit.:298*).*

In light of the formational and sociocultural perspective in this chapter these observations are interesting the way they emphasize content and context. Shuell's article was published before the educational impact of the Internet. Nevertheless his views have a bearing when it comes to the dynamic interaction between learners, peers, teachers and artifacts in networked environments. His call for teaching and learning to be studied simultaneously and the view that both instructional and learning variables should be considered at the same time (op.cit.:302) point to the roles of teacher as learner and co-learner and learner as co-teacher, patterns we see emerging in classrooms that become technology-intensive. Other researchers have also pointed to a trend towards a dismantling of the teach/learn dichotomy (Gobbo & Girardi, 2001; Kuure et al., 1999; Mercer, 1995). In her study of teachers of French as a foreign language in an online environment, Elizabeth Murphy (2000) emphasizes, “Most importantly, teachers themselves become learners along with students”. In sum, learners as well as teachers continuously de- and re-contextualize their activities.

Traditionally, learner and teacher roles have manifested themselves through the different *scripts* learners and teachers execute. Scripts have traditionally been regarded as representations of standard action sequences, e.g. in the form of greetings. In a sociocultural perspective, scripts will be perceived as socially and culturally oriented communicative processes that involve different degrees of power, authority, responsibility, and positioning. According to Gutiérrez et al. (1995:449), “A script, then, represents an orientation that members come to expect after repeated interactions in contexts constructed both locally and over time”, and “a range of recurring patterns of activity within and across events in which members’ actions display stable ways of engaging with others” (Gutiérrez & Stone, 2000:155).

Such scripts can be used to analyze classroom discourse. For instance, a teacher’s script will be ‘official’ in the sense that it is expected to convey targets in the curriculum along with the broader, societal values that underpin it. Learners’ scripts may sometimes take the form of counterscripts, i.e. they are marginal, resistant or subversive to the ‘official’ script:

> *Those students who resist the normative institutional practices of the classroom, or whose local and cultural knowledge are often displaced, often form their own counterscript. This displacement of student knowledge motivates a different social space in which counterscript develops, that is, the underlife of the official space (Gutiérrez & Stone, 2000:156).*

Tension, conflict, and possible breakdown of the educational activity may be the result. However (and in line with Activity Theory), such tensions and conflicts may also "be brought into productive play" (Daniels, 2001:127) and open the possibility of a joint script with alternative and perhaps unexpected goals and activities, not necessarily irrelevant to the overall learning trajectories of participants. Such a joint script equals what Gutiérrez and Stone (2000:157) call "third space": "The third space is a discursive space in which alternative and competing discourses and positionings transform conflict and differences into rich zones of collaboration and learning". As such, this third space is 'unscripted', open to practices where the teach/learn dichotomy is not the constitutive element but "this juxtaposition of relative perspectives involving struggle among competing voices – that creates and maintains the third space" (Gutiérrez & Rymes, 1995:467).

The notion of a third space is exciting in light of networked technologies. As ICTs increasingly facilitate communication and participation they also afford a richer array of positions and empowerment of participants. Relationships between the individual and the collective, between learner and teacher are transformed as technologies mediate new participatory genres, new conventions, and more diverse opportunities for engaging in linguistic exchange. According to Gordon Wells, we need to take multiple perspectives into consideration; "ways in which the participants' different activities can be brought into greater convergence, leading to a common goal – a *shared* learning and teaching activity type" (Wells, 1999:205-6. emphasis in original). It would seem that networked ICTs allow for more of the learner's lifeworld and culture-of-use to be invested in the joint script that emerges. In Chapters 6.4.5 and 6.4.7 we see how joint scripts and third space materialize in the case of a class engaging in discussion online.

The conclusion is that, for didactics not to be reduced to method and technique, the discipline needs to develop a concept of knowledge that embraces teaching and learning as mutually constitutive processes, that embraces a notion of subject knowledge as negotiated and jointly constructed, and a notion of technologies as transforming and becoming transformed in the course of such processes. In the process of such transformation, traditionally separate teachers' and learners' scripts may become reconfigured in a joint script, a third space. This is not just a didactics of what, how and why, but a discipline that addresses relations, positions, and designs conducive to deal with the complex, the uncertain and, the unexpected.

3.11. Conclusion: Didactics as transformational and relational designs[85]

Gundem ends her overview of European didactics with a glance at the future (Gundem, 1998:65-66). She locates its key processes within the *Bildung* tradition of analysis and reflection, its relevance in the relationship between academic research and practice, and the overall emerging trend as interest in classroom practices. Moreover, she finds this development in Scandinavia and Continental Europe as well as in the Anglo-American community. However, much research is still needed in order to operationalize a viable concept of didactics for the 21st century. In the present chapter three girders will be offered; didactics of multiliteracy (Cope & Kalantzis, 2000), relational didactics (Edwards, 2001;

[85] It should be pointed out that the term *design* in the present study is very much different from what came to be known as *instructional design* around the use of ICTs in the 1980s. Instructional design addressed learners' motivation, attention, and abilities within an acquisition perspective. *Design* in the sense used in the present study has at its core elements that afford participation in authentic, mature practices and discourses, often across knowledge domains.

2002), and – with a view to *subject* didactics – didactics as social practices (Kramsch, 2000a; Savigon, 2002).

The New London Group uses the concept of *multiliteracies* as a point of departure for a new type of didactics, (and one that could be especially relevant for EFL):

> *In so far as there cannot be a standard, universal, national language and culture, there are new universals in the form of productive diversity, civic pluralism, and multilayered lifeworlds. This is the basis for a transformed pedagogy of access – access to symbolic capital with a real valency in the emergent realities of our time (New London Group, 2000:18).*

In sum, the group sees pedagogy as *Design* and teachers as *designers* (op.cit.:19). To give an example, EFL would be seen as an existing Design, a particular configuration of semiotics (textual, aural, visual) and conventions (genres, styles, registers). This discourse is situated either in schools or in diverse out-of-school contexts, which, in turn, will give the subject different flavors. For instance, English as it is contextualized in juvenile chat rooms gets much of its meaning from that particular context. This is the *Available Design*, the 'raw material' from which learners redesign their version of the available design by constructing new meaning. Meaning (and knowledge) is appropriated and developed from the Available Design in accordance with the learner's life world. This transformation brings about a new design, the *Redesigned*, with new resources, affordances that emerge during the process of redesigning[86]. Also, the design process can easily be transposed to teachers and ICTs where the Redesigned include the shared affordances of a technology-rich environment and the practices that are mediated by the technology. The keyword *transformed* in the previous quote is operationalized in four mutually dependent moves that add up to a didactic program. "The four aspects of the pedagogy represent epistemological orientations (…) that will provide students with multifaceted ways of reading the world" (Kalantzis & Cope, 2000b:241):

- *Situated Practice*, "contexts that render what is being taught meaningful" (Gee, 2000:67), i.e. the world of learners form the common ground for learning. The teacher works much like an ethnographer, discovering what learners know and can do
- *Overt Instruction* to foster a metalanguage for design processes and scaffold conscious, focused higher order learning processes, i.e. to know why something is important
- *Critical Framing*, which relates local understanding to social (historical, cultural, ideological) contexts
- *Transformed Practice*, i.e. the ability to recreate design processes in other contexts so that reflective practices are fostered, including articulating one's own voice and interest. This is not just consuming but involves transformation of identities

It is possible to see the four moves as a variation on and extension of the Vygotskian notion of ZPD; learners are going from a situation they know into a new and demanding context by exploiting affordances found in more knowledgeable peers, tools, and by participating in communal practices. Also, there may be tensions between the four components, for instance between the immersion approach found in Situated Practice and the explicit scaffolding found in Overt Instruction. Both approaches will find a theoretical rationale in the Vygotskian tradition and in particular his construct of the ZPD (Cazden, 2000:262, cf Chapter 2.3.6).

[86] *Joint scripts* and *third spaces* discussed in the previous subchapter (also cf Chapter 6.4.7) may be regarded as instances of the *Redesigned*.

The ultimate aim for the New London Group is to see a pedagogy of multiliteracies as a design of social futures and negotiating across differences in which minority groups and the unprivileged participate. Here they touch base with Klafki and the *Bildung* tradition. Hence, the construct of multiliteracies and its accompanying pedagogy seem a fertile ground for developing didactics in networked, technology-intensive settings. However, The New London Group does not address questions of technologies, the distributed nature of learning and mind, and collective/individual learning in great detail (Cazden, 2000; Gee, 2000 are both exceptions). These issues have epistemological and didactic implications in the sense that they shift focus from content (what) and manner of teaching (how) towards *relational* aspects. Such concerns are often discussed in e.g. CSCL literature and general socioculturally inspired research. It would seem as if this is an area that is in great need of further research if classroom practices are to benefit by new insights.

A starting point may be Gordon Wells' (1999) comprehensive and thorough work on dialogic inquiry as a basis for a sociocultural perspective on pedagogy. Wells finds that a Vygostkian approach is compatible with linguist M.A.K. Halliday's theory of language. They both view learning as a social endeavor and language as a cultural tool that mediates between past and present culture, historic and future insights, local and general conventions. This brings Wells to formulate the following framework for learning:

> *A comprehensive language-based theory of learning should not only explain how language is learned and how cultural knowledge is learned through language. It should also show how this knowledge arises out of collaborative practical and intellectual activities and, in turn, mediates the actions and operations by means of which these activities are carried out, in the light of the conditions and exigencies that obtain in particular situations. Finally, such a theory should explain how change, both individual development and social and cultural change, occurs through the individual's linguistically mediated internalization and subsequent externalization of the goals and processes of action and interaction in the course of these activities (Wells, 1999:48).*

In this passage, Wells outlines a theory where change is attributed to both the individual and the social since the individual takes part in collaborative activities. When such a theory is given a didactic angle, the question becomes how to operationalize it, make it visible, so that participants recognize and take control of their learning trajectories. With networked ICTs integrated in the classroom, this involves empowering learners to manipulate their learning environments, know when to seek assistance, and join in activities with others so that the potential for knowledge construction can be discerned and made available. This is not so much a matter of planning, often seen as a core element of didactics (Schnack, 1993) as of *design* (see below, also cf Chapters 6.4 and 6.5.1). How learners, technologies and subject matter can be configured in innumerable ways, more or less conducive to goals, becomes a matter of designing a relational didactics. Anne Edwards identifies these relational elements:

> *Teaching is not merely a cognitive act or simply a performance. It is a relational orchestration of time and space, self and others, learners and knowledge, and affect and cognition. (…) we need to return to the premise that mind, for example, a teacher's mind, is itself a weaving together of past and present, and layers of self and context (Edwards, 2001:179).*

This represents an extension of teachers' repertoires. It does not see overt scaffolding as the primary teacher work in a ZPD, but arranging for "relationships within the development zone which have as their goal enhanced interpretations of and responses to the environment for all participants" (A. Edwards, 2002:3). Edwards makes a call for *relational agency* where the focus should be on "learners' *capacities* to work relationally" (op.cit.:4, emphasis in original).

Such relational agency requires the ability to acknowledge the motivation and potential of others as well as ability to use contextual resources in the form of relationships with others. For teachers, this means developing their capacity to design for and transform unplanned incidents and phenomena into teachable moments. The notion of relational didactics can be said to be incompatible with planning but compatible with design. This is largely due to its situated nature and multi-directional potential. A relational didactics will necessarily have to "break out of the diachronic constraints of planned delivery to work synchronically to connect learner and subject" (Edwards, 2001:166).

In the case of language teaching, it means orchestrating a complexity of meaningful assignments, positions of participants, and a suite of technological means that together produce affordances for language development. Also, it includes the more 'unofficial uses' of language situated within the lifeworlds of young learners as a resource (Kramsch & Thorne, 2001). How this materializes in practice is illustrated in chapter 6. In this chapter, the notion of *design* is crucial as a gateway to analyzing practices of teaching and learning in technology-rich environments. Consequently, the construct of *design* needs some elaboration.

First, *design* differs from *planning* in that the former targets what *may* happen; serendipity, breakdowns, focus shifts. It does not necessarily promote chaos but it acknowledges its creative potential. Planning involves result, e.g. in the form of a certain practice, while design sees a practice as one of several possible responses. Learning cannot be designed, but settings can be designed, configured, so that learning is a probable result. Etienne Wenger defines design in the following way:

> *By "design" I mean a systematic, planned, and reflexive colonization of time and space in the service of an undertaking. This perspective includes not only the production of artifacts, but also the design of social processes such as organizations or instruction (Wenger, 1998:228).*

The present study adopts Wenger's definition of design as a social practice, but would place more emphasis on the uncertainties involved and less emphasis on the systematic and planned dimensions in order to embrace the notion of relational didactics above. This involves placing as much emphasis on a curricular item as experienced by the learner as planned by the teacher. Deployment of affordances, orchestrating learners' encounters with them, and grasping the teachable moments that occur would be at the heart of design as understood in the present study. The present study argues that this understanding of design is in line with Leach and Moon (1999:274) and their agenda for recreating pedagogy; "a move away from the technical instrumentalization of methodology towards an understanding of the complex elements involved in creating effective communities of practice".

Didactics framed in terms of multiliteracies, relations, and design of social practices means that it is subsumed under a distinctly sociogenetic view of human conduct (cf Chapter 2.2.2), i.e. that human psychological processes are social in nature and that they are mediated. This basic assumption makes it possible to bridge the cultural and the individual, the context and the person, and target the zone where these sociogenetic and ontogenetic domains intersect. In other words, such zones illustrate where a sociogenetic (and, consequently, a sociocultural) perspective transcends behaviorist or cognitive perspectives on didactics. Such zones can be designed but the (reciprocally constituted) learning-and-teaching that takes place within them cannot be planned. Historically, curriculum-oriented planning and implementing relevant teaching have been typical of didactics (Hoel, 1998). In contrast, didactics understood in a sociogenetic perspective captures the zone where culture and cognition interact. Designs lend

structure to such interactions while the situated and relational dimensions open up for a most essential characteristic in human conduct; improvisation.

3.12. Overview

Chapter 3 has argued that for EFL teachers practicing in networked, ICT-rich environments, a sociocultural perspective on learning, teaching, and technologies might be one way to develop subject didactics of EFL to support and guide their efforts. At the heart of the account have been the ongoing changes in subject matter, the way it has been taught, and the shifting approaches to technologies and didactics. The formative aspects of didactics (*Bildung*) have been emphasized since technologies do not only present themselves as ready-made instruments for certain tasks and development of definite skills, but as cultural tools carrying inherent qualities that transform our lives and mediate our learning about the world.

Table 3.1 below aims to encapsulate the composite field covered in the present chapter. It builds on, adapts, and extends overviews developed by Timothy Koschmann (1996a), Mark Warschauer (2000a), and Claire Kramsch (2000a), as well as numerous other contributors to the field of EFL, ICTs and didactics (and beyond). The columns should be read more as trends than sequences of shifts or discrete categories. Combinations and overlapping are common. Also, the table is simplified and thus deliberately ignores a lot of detail and obscures the complexity of reality, e.g. the fact that while the dominating view of language underpinning CALL might be structural in the 1970s and 80s, this is not the case for a more general view of language during the same years. Still, the table might encapsulate the tradition and current situation teachers face when they find themselves at the interface of a subject, mediating technologies and didactics in transformation.

Table 3.1 Paradigms relevant to the intersection of EFL, ICTs, and didactics

Paradigm	Structural/ Behaviorist	Cognitive/ Communicative	Sociocultural
Time of impact	1970s – 1980s	1980s – 1990s	1990s - 21st Century
View of Language	A formal, structural system	A mentally constructed system	Developed in social interaction
Language Teaching Approach	Grammar-Translation, Audio-Lingual, Instructional ICTs	Communicative Language Teaching, Comprehensible Input, Acquisition, Interactive ICTs	Multiliteracies Socialization, Collaborative ICTs
Didactic focus	*How* Method-oriented	…and *What* Content-oriented	…and *Why- When – Where* Relational designs
Technology	Mainframe, tutorial software	PCs, ' educational' software	Multimedia and Internet, convergence
Principal Use of Computers	Drill and practice	Communicative exercises	Authentic discourses
Location of activity	Computer lab	Co-located; Labs, classroom, library	Networks, local and distributed online (school and out-of-school)
Principal Objective	Accuracy	Fluency	Social interaction
Research Issues	Technologies, Software	Learners' use of ICTs	Information Ecologies
Research focus	Efficiency and effects	Cognitive processes	Transformation through participation

The above matrix does not capture the larger, socio-political and ideological issues involved. While these are beyond the scope of the present study, a brief look at some aspects of Norwegian educational politics is needed in order to see how they correlate with the trend outlined above.

3.13. Interlogue: policies - teachers at the interface

The previous section has tried to encapsulate trends that have led up to the situation teachers currently find themselves in. But what takes place in academia and research communities and in the 'real world' of a subject does not always, nor quickly, make an impact on teachers' practices. The link between research and development communities on the one hand and teacher communities on the other has often been lacking (Anderson & Herr, 1999) (although this seems to be changing with an increase in school – research partnerships). However, a link may be found in policy papers that try to capture new and beneficial insights and transform them into guidelines for action and integration in school practices. In the case of Norway, with the advent of ICTs two types of policy papers become especially relevant; firstly, curricula because they state the goals of the course and thus point ahead to exams and

assessment and secondly, national plans for the implementation of ICTs because they address current and future trends and (indirectly) suggest how to cope with these, e.g. in the form of in-service training. Together they are instrumental in bringing teachers in contact with technologies. The questions are in what way, to what extent, for what purposes, and in which perspective? Policy documents constitute a 'school knowledge' discourse (cf Chapter 3.9.6) that may not automatically be aligned to teachers' pedagogic knowledge, or the current requirements from subject knowledge. Teachers may find themselves at the interface of, or in a 'squeeze' between, various discourses. A brief look at two types of policy documents may illustrate the issue[87]:

- A curriculum for each of the three years of English in upper secondary school
- Two national plans for ICTs in education, (KUF, 1995, 2000)

Curricula

In 1994, the Norwegian educational reform for upper secondary school brought about curricula that placed less emphasis on mandatory topics, authors and quantification of material in favor of goals to be attained. In the case of English, its rationale is partly found in an ability to face internationalization and how English as a world language dominates science, media and business. Utilitarian value is emphasized. But so is the role of a foreign language, culture, and heritage as constitutive in fostering critical reflection and identity building. In sum, knowledge, skills and personal growth might be said to constitute the profile of the curriculum, although the latter is more implied in the general introductions to the curricula than explicated in the goals formulated in them.

In the curriculum for the foundation course in English, ICTs are only mentioned in passing. When they are, it is in a list of introductory goals where one item states that learners should "be able to utilize diverse tools such as dictionaries, grammars, reference works, and available information technology" (my translation). As for the goals attached to skills or topics, technologies are not mentioned. In the curriculum for the second and third year (including revised versions from 2001), ICTs fare no better. It says that learners should "be able to use information and communication technology and other available information sources in a critical and independent way" (my translation).

The view of ICTs found in these curricula is primarily an instrumental one. In the foundation course, ICTs are seen as add-ons to the textbook and workbook, as tools in the most restricted sense and without the *communication* element present in the term used. Placed alongside reference works, it becomes embedded in a view where efficient access to information and transfer of the same amount to a utilitarian belief. Of course, in the early 90s it is not fair to demand a particularly perceptive vision of ICTs, but still it is significant that with the impact ICTs were having on all aspects of social life at the time they were only assigned a supporting role for established practices.

The 2001 version of the curriculum shows development, if not a new position. The *communication* element has been made part of the term and the acronym ICT, it has been moved to the front in the category of 'information sources', and – more importantly – has been assigned a critical dimension. However, this is still basically an instrumental view, just more sophisticated. There is nothing in these curricula that points to innovative practices or

[87] Exam papers could also be added to these two categories. However, at present national exams in English do not incorporate ICTs in any way. New style exams with ICTs and networks are being developed. Where they influence practices is discussed in Chapter 6.7.

ways to transcend constraints in the language classroom. The focus is on the ability to *use* ICTs, not on their mediating role and transformative potential for social and cognitive development. For teachers (and, consequently, learners) there is nothing that might support them appropriating ICTs beyond an instrumental or conceptual understanding. Initiatives would have to come from other quarters.

National plans[88]

The two national plans on ICTs in Norwegian education, covering the years 1996 – 2003, have become the policy documents with the greatest impact on ICTs in education. As these plans are programs for action, they have initiated efforts that concern educationalists on every level, for teachers this is especially true of in-service training. In addition, and contrary to the terse wording of the curricula, these plans carry a rhetoric that rests on political intentions and educational beliefs and assumptions. Without going into detailed discourse analysis, it is worth pointing to some of the more pervasive rhetoric and the pedagogic perspective this rhetoric arises from.

The first plan (KUF, 1995) uses the term *IT*, and has the motto *Learn to use – Use to learn* as its guiding light, a principle backed up with initiatives that center on instrumental skills and certification. This instrumental approach is typical of the plan as a whole, although there are elements that point to new teaching and learning practices. However, these opportunities are never put into concrete terms, and there is no trace of educational debate, a view of knowledge or alternative approaches. Further insights are in demand: "There has been far too little research on the field of teaching methods, what in the field is referred to as didactics" (KUF, 1995:11). On the whole, the plan is monologic in its promotion of ICTs as a modern project that will realize the political goal of Norway "asserting its place among the leading nations of the world" (Elstad, 2000:4).

This somewhat high-strung rhetoric has been moderated in the successive plan for the years 2000 – 2003 (KUF, 2000). Also, the focus has shifted from a purely tools-oriented approach to a more critical and reflective approach. The introduction points to how "we have seen the use of ICT in education and learning bring about changes in organizing and working methods and create new opportunities" (op.cit.:1). This view is echoed later in the plan when it points to ICTs having the potential as "a promoter of change and development of new pupil, student and teacher roles" (op.cit.:9). The plan cites statistics that find Norway among the leading nations when looking at the number of pupils per computer ratio, while Norway scores comparatively low when looking at innovative use of ICTs, professional development, and expectations to the technology. The plan argues that ICTs may "change traditional curricular content" (op.cit.:5) but the instrumental approach, where ICTs are seen aids and remedies dominates the text. Teachers' pedagogic use of ICTs is identified as a key competence that is presently lacking, but there is no attempt at defining what 'pedagogic' means in this context, except where it is linked to "increased focus on forms of working, organization and assessment, and on ICT as a tool in such development" (op.cit.:8). When future goals are articulated they are linked to society's need for competence, and this competence is sought in concentrating on in-service training for teachers and several research and development programs. The large-scale *Tower* course (cf Chapter 5) must be regarded in relation to these measures. Finally, it is interesting to note that "In revisions of curricula and educational frameworks ICT should be integrated as a pedagogic tool that springs out of the distinctive character of the subject/domain and in line with technological possibilities" (op.cit.:14).

[88] Where these policy papers are cited, all translation into English is made by the present researcher.

In conclusion, the rhetoric of curricula and policy papers lacks coherence in several ways. Firstly, while emphasizing innovative possibilities the plans "make ICT merely into an extension of the textbook" (Østerud, 2000:82, my translation) and consequently maintain an epistemology where ICTs are merely regarded as more efficient instruments of transfer of pre-defined material. The plans place ICTs in a functional and technocratic framework, not cultural and pedagogic despite insistence on the latter in the second plan. Secondly, the two national plans push ICTs to the fore of economic, social, and educational development while there is hardly anything in the English curricula that captures such an ambitious vision; in these ICTs hardly play a role at all. Moreover, behind the persuasive rhetoric of the plans, "a fable for our time" (Elstad, 2000), educators find little guidance behind the impression of departmental vigor. For instance, a teacher wanting to implement ICTs in her classroom would have to guinea-pig and/or seek out specialized literature on the subject. This is an important backdrop when analyzing teachers' encounters with technologies. It shows that teachers are expected to integrate ICTs in their practices but that there is no coherent educational vision and accompanying practical guidelines to lead such an integration. Teachers will find themselves at the interface of diverse but not very clearly articulated discourses, at the interface of established and possible novel and innovative practices, and at the interface of the physical, co-located classroom and the on-line, distributed variant. *The Tower* in-service course (cf Chapter 5) should be seen as a response to such a situation.

While Chapter 2 has laid out the theoretical framework and the present chapter has framed the field to be researched, Chapter 4 will consider research methods to approach and capture the complexities involved when looking into teachers' beliefs concerning ICTs, their appropriation of ICTs, and their practices in technology-rich environments.

4. Methods and Methodology

> *Although qualitative studies are rich in descriptions of settings, people, events and processes, they often say little about how the researcher got the information, and almost nothing about how conclusions were drawn (Miles & Huberman, 1994:282).*

4.1. Introduction

While a theoretical and conceptual framework was discussed in Chapter 2, Chapter 3 sought to frame the compound field to be studied through a sociocultural lens. The aim of the present chapter is to discuss the methodology, methods and procedures used to capture essential aspects of the field as well as the diverse types of collected data. Any method used to elicit data will influence the interpretation of them. Hence, the current chapter aims to clarify how the theoretical perspective in Chapter 2 has been analytically operationalized in order to capture the composite field described in Chapter 3.

Firstly, the relationship between method and methodology needs to be clarified. In *Research Methods in Education*, Cohen and Manion (1994:38) define *method* as "the range of approaches used in educational research to gather data which are to be used as a basis for inference and interpretation, for explanation and prediction". The aim of *methodology* is identified as "to describe and analyse these methods, throwing light on their limitations and resources, clarifying their presuppositions and consequences, (…)" (op.cit.:39). This makes methodology take on a meta-perspective towards method.

Secondly, the relationship between different types of data needs to be clarified. Cohen and Manion present normative and interpretative studies, quantitative and qualitative data in complementary light and argue that social scientists should be concerned with combining them: "The problem becomes one of determining *at which points* they should adopt the one, and at which the other, approach" (op.cit.:40, emphasis in original)[89]. This problem is closely related to the phenomenon studied and the research questions raised.

In Chapter 1.1, the phenomenon examined in the present study was described as teachers' encounters with ICTs and how they appropriate ICTs in their work. Also, the complexity and multi-faceted nature of the phenomenon was underlined (e.g. timescales involved, cf Chapter 6.2). Such complexity makes it difficult to capture the phenomenon through one single research method. Three research questions frame the phenomenon (cf Chapter 1.2), and they are sought answered by adopting different methods:

- Research question no. 1 asks about beliefs and attitudes of a sample of EFL teachers who encounter ICTs. To answer this question a quantitative approach in the form of descriptive statistics (supplemented by discourse analysis) is used.
- Research question no. 2 asks about what kind of educational practices that emerge when teachers of EFL integrate ICTs in their classes. To answer this question a qualitative approach in the form of ethnography (supplemented by informal interviews) is used.
- Research question no. 3 asks under what conditions we see innovative practices emerge. To answer this question data gleaned by the quantitative and qualitative

[89] Cohen and Manion refer to Merton, R.K. & Kendall, P.L. (1946) The focused interview, *American Journal of Sociology*, 51 pp 541-57, as the source for this quote.

research methods outlined above are interpreted along several levels (classroom, institutional, national).

Consequently, this study argues that what is needed is a *mixed methodology* as well as a *multi-level analysis* (for a more detailed research design, cf Chapter 4.5.4).

A theoretical perspective, in this case a sociocultural framework, should be consistent with (or: at least not in conflict with) research methods chosen. Although there is no such thing as 'recommended sociocultural research methods', Bridget Somekh (2001:159) in a study of policy making in UK education states that, "I adopt sociocultural research methods which involve close participation with participants at all levels of societal or institutional hierarchies of power". While not attempting to study 'all levels', the present study applies a mixed method and multilevel analysis. Methods include descriptive statistics (applied to both forced choice and open-ended questions), ethnographic research on classrooms as well as virtual communities, elements of discourse analysis, and some informal talks and semi-structured interviews. Such a *Mixed Methodology* design (Tashakkori & Teddlie, 1998), while reflecting eclecticism, is intended to bridge research questions, the composite field to be studied, and theory on the one hand, and unit of analysis, types of data, types of description, and conclusions on the other. Levels discussed appear at individual, collective and institutional planes. The relationship between methods and levels will be discussed more explicitly in 4.5.7.

The primary purpose of this chapter, then, is to discuss such a *Mixed Methodology* approach to the research questions: the metaphors and the techniques that have been used in the inquiry, ending with a discussion of the unit of analysis chosen. The chapter is divided into six main sections: Qualitative Research, The role of the researcher, Metaphor, Presentation of the Mixed Model research design, Type of data gathered and data collection procedures, and finally The level and unit of analysis.

4.2. A Note on Qualitative Research

4.2.1. Characteristics

Qualitative research spans such a variety of fields, methods and theories that it is, of course, futile to attempt any overview or exhausting list of characteristics. A history of qualitative research, its current position, and possible future directions can be found in e.g. Bryman and Burgess (1999) and Denzin and Lincoln (1998). However, since the present study is rooted in a qualitative tradition while also making use of quantitative methods (survey), a brief note on relevant aspects of qualitative research is pertinent. In a survey article on Qualitative Research, Bryman and Burgess describe its characteristics as follows:

> *… qualitative research is a strategy of social research which deploys several methods (often in conjunction in specific studies) and displays a preference for: the interpretation of social phenomena from the point of view of the meanings employed by the people being studied; the deployment of natural rather than artificial settings for the collection of data; and generating rather than testing theory (Bryman & Burgess, 1999:x).*

While the present study of teachers' appropriation of ICTs clearly falls within the framework cited above, it neither aspires to *generating* theory nor *testing* one. Rather, it uses a theoretical perspective because it offers a worldview that is perceived as being conducive to increasing our understanding of the phenomenon. But at the same time, this particular perspective is not seen as a Procrustean bed for research. Consequently, the qualitative element of generating should come across as *developing aspects* of the sociocultural theory adopted. Emergence of

theoretical aspects and a deeper understanding of theoretical aspects involved are key issues in the present study. Still, this is not primarily a theoretical study but one that intends to use and develop a theoretical lens to better capture a phenomenon.

Norman K. Denzin and Yvonna S. Lincoln in their definition of qualitative research (1998:3) also play down the element of generating theory but stress making sense of and interpreting phenomena, "to get a better fix on the subject matter at hand". They also emphasize the multimethod focus, and the wide range of empirical materials that can be used. To the present researcher, one element stands out: "… phenomena in terms of the meanings people bring to them" (op.cit.:3) [90]. This is a situated perspective that in many ways bridges a central sociocultural tenet and a particular qualitative research method. It is also an echo of the discussion on relativism and the perspectives and intentions people bring with them when encountering phenomena (cf Chapter 2.2.8).

But Denzin and Lincoln also stress the differences between qualitative and quantitative research. Through five points of difference, "uses of positivism, acceptance of postmodern sensibilities, capturing the individual's point of view, examining the constraints of everyday life, and securing rich descriptions", they tie the two types of research to different epistemologies and different forms of representation (op.cit.:8-10). At this particular point, the more constructionist view of Denzin and Lincoln part with e.g. the more realist, empirically grounded view of Miles and Huberman (1994) who advocate a more eclectic approach to qualitative research. Such eclecticism is echoed in the present research design, while the more 'post-positivist' leanings of Miles and Huberman (according to Denzin and Lincoln) are less so.

The following account of research methods also owes a lot to Mats Alvesson and Kaj Sköldberg's book about interpretation and reflection (1994). Writing from a qualitative perspective, they navigate the topography between empiricism and the philosophy of science, thus building bridges between theory and method. The authors find that qualitative research is characterized by its focus on ambiguous empirical material and its perspective as belonging to the people who are being studied, but they do not draw a sharp line of distinction between qualitative and quantitative methods. Instead, they argue for "reflective empirical research" (op.cit.:11, my translation). This type of research rests on four considerations, which in turn are inspired by four types of qualitative research:

- A systematic and logical approach to interaction with empirical material. Inspired by grounded theory
- Research as interpretation. Method cannot be separated from theory since assumptions and constructs influence interpretations of the purpose of the study. Inspired by hermeneutics
- Awareness of the political-ideological character of research. Inspired by critical theory
- Reflection regarding problems of representation and authority, the questioning of both researcher and the object of study. Inspired by postmodernist directions

The point is not to combine incommensurable approaches, but to point to elements that together add to the reflective character of qualitative research, and to point to the fact that

[90] This situatedness is seen by Denzin and Lincoln as applying to *their* definition of qualitative research as well: "Indeed, any attempt to give an essential definition of qualitative research requires a qualitative analysis of the circumstances that produce such a definition." (N.K. Denzin & Y.S Lincoln, 1998:32)

interpretation takes place at different analytical levels. Reflection is also directed towards the researchers' conditions for reasoning; how we socially construct ourselves as well as the image of the other through participation in the research process. This line of thinking has inspired the discussion on the amalgamation found in mixed methodology and how different types of data give opportunities for reflection. It has also inspired the way *episodes* (cf Chapters 4.7.2 and 6.2) of classroom interaction have been analyzed.

4.2.2. Ethnography

Since so much of the data in the present study is drawn from classroom observations, questions of ethnography emerge: To what extent does the present study qualify as ethnography? What shape does it take? Which dimensions are accentuated in the present study?

According to Atkinson and Hammersley, (1998:248) ethnography has been differently perceived on a scale from philosophical paradigm to research technique. In the present study, it is neither. Rather, it is understood as a particular approach to getting on the inside of human conduct known as participant observation. As such, it is not strictly method, but "a mode of being-in-the-world characteristic of researchers" (op.cit.:249). Exploring the nature of a social phenomenon through unstructured (i.e. not coded) data, and a limited number of cases are typical features that amount to an interpretation of human actions. These features rest on an assumption that researcher and observed participants are in dialogue; their perspectives and cultures may be different but equal.

Alexander Massey formulates a more detailed account of ethnographic features, or requirements for research to be termed 'ethnographic'. Seven elements are listed (Massey, 1998, adapted):

1. A study of culture, which is understood as made up of certain values, practices, relationships and identifications, capturing "the way we do things around here"
2. Multiple methods and diverse forms of data (a major topic in the present chapter)
3. Engagement over time, long enough to see things happening repeatedly (pursued in Chapter 6.2)
4. Researcher as instrument (discussed in Chapter 4.3 below)
5. Multiple perspectives (pursued throughout the present chapter)
6. Cycle of hypothesis and theory building. The present study takes a somewhat more modest stand than theory building in that it through an abductive approach (cf 4.5.6 below) aims at a deeper understanding of practices in light of a sociocultural perspective
7. Intention and outcome. Massey underlines the double perspective of researcher and participants to emerge. This is equivalent to the emic/etic perspective discussed in Chapter 4.3.4 and the purpose of the present study (cf Chapter 1.6.1). Outcomes are discussed in Chapter 7.2.

The above outline of ethnographic characteristics applies to the classroom observations in the present study, although not in full as to item 6. In addition, it captures the three characteristics Clifford Geertz attributes to 'thick' ethnographic description (1993:20): "it is interpretive; what it is interpretive of is the flow of social discourse; and the interpreting involved consists in trying to rescue the 'said' of such discourse from its perishing occasions and fix it in perusable terms". What follows in the present chapter is a discussion of methods, types of

data and unit of analysis that aims at avoiding the fallacy of 'going native' or drifting "into a combination of intuitionism and alchemy" (op.cit.:30).

4.3. Role of the Researcher

> *A source of data, which is usually ignored, is your personal knowledge about a culture, a group, or an organization. Although this knowledge is not systematically measured, it provides an auxiliary source of data that can enrich your collected data. (…) For a mixed model researcher, even when inferences are based on highly systematic quantitative data, personal observations of the context of data collection as well as interactions with the individuals who are the sources of data are valuable sources of information (Tashakkori & Teddlie, 1998: 110)*
>
> *Behind every research method lies a belief, and behind every belief lies a person (Warschauer, 1999:188)*

In many ways, the researcher is the primary research tool. S/He is instrumental in placing the research issue on the agenda, in taking a theoretical position for the study, in applying research methods to the inquiry, and in interpreting results. Consequently, the "richness" or "thickness" (Geertz, 1993) of the account increases with a researcher's biography, and makes it easier to judge the trustworthiness of the account.

In the present study, the researcher is also a participant observer:

> *"the participant observer is rarely 'just' an observer, if we mean by this watching and listening in the social situations in which the researcher is located. Participant observers invariably also interview people, particularly key informants, and examine documents"(Bryman & Burgess, 1999:xvii)*

While this is obviously true, it is necessary to add that being a participant observer also means being immersed in social practices supplementary to one's own. For the present study, this immersion equals the present researcher's work in the midst of participants who were engaged in *The Tower* in-service training course, and – for a number of years - in the midst of teacher colleagues, learners, and ICTs. To this must be added the social practice of doing research.

4.3.1. Researcher's Background

I was a teacher in the Norwegian Upper Secondary School from 1979 until 1999. From 1985 and onwards, I was involved in several experiments, projects and programs, both national and transnational (Lund, 1997), involving ICTs in teaching and learning in general and in EFL in particular. This included working as an animator in a series of workshops in the field of ICTs in Vocationally Oriented Language Learning (VOLL) under the auspices of the Council of Europe (1993-2003). Especially relevant to this study is my experience as one of the county coordinators for the in-service training course, *The Tower* (1999 - 2000), numerous courses, workshops and lectures for educators, and my experience as a teacher in technology-rich environments. The latter includes working with experimental forms where ICTs were integrated in new style exams, similar to the situation as described in the case of teacher Tom (Chapter 6). This testifies to my fascination with technology mediating learning processes. But what worried me right from the advent of digital technologies in teaching and learning was the technology-driven approach, a concern for what I saw as lack of interest in teachers' encounters with this technology, and the few accounts of such encounters[91].

[91] Cf the lack of 'state of the art' referred to in Chapter 3.1.

As my interest in ICTs continued to escalate I noticed the disparity between various discourses embracing the phenomenon. There was an official, institutional and policy-driven discourse that often associated ICTs with economic gains, 'more efficient' or 'better' teaching and learning. This type of discourse placed expectations and demands on teachers to make ICTs materialize as a catalyst for such gains. Teachers, I argue, felt such demands but were at a loss how to cope with them. Thus, a teacher discourse developed, associated with equipment – software, hardware, broadband – and centering on *the* package, *the* skill, *the* trick etc. that would meet demands articulated in the first type of discourse. As I moved into research, I noticed that there was a research discourse as well, and one that addressed the mediating, transformative qualities of ICTs while embedding them in broader issues of teaching and learning. This type of discourse was rarely picked up by practicing teachers[92].

Thus, my interest in computer assisted language learning right from the start was accompanied by a suspicion that technology-driven, instrumental approaches were, at best, insufficient, at worst, harmful to integrating and bringing about insights in CALL. I (along with many other teachers) experienced that the world of a teacher is much too complex to merely treat ICTs as an add-on to established practices, and that this complexity increases when ICTs saturate the learning environment. Anecdotal material on teachers' inability or reluctance to embrace and utilize ICTs was (and is) abundant and I started to wonder why integrating technology in teaching often proved to be such an uncomfortable process. Thus, while acknowledging the truth in the warning "I began as a nonparticipating observer and ended up as a nonobservant participant" (Miles & Huberman, 1994:266), I maintain that my experience has made me into an informed participant when observing life in classrooms.

The result of my own practice with ICTs was an increased interest in theories of learning and didactics as a means to understanding what was going on. Personal experience and extensive reading started to materialize in the form of questions, hypotheses and speculation that needed to be treated on a more informed and principled level. Only then, I felt, could teachers' practices and beliefs regarding use of ICT be understood. This *abductive* approach will be treated in detail in Chapter 4.5.6. But, as I see it, just as important as a theoretical framework and a methodological approach is the experience of participating within a culture of teachers, learners and technology. It is this experience that guides my choice of research field, my choice of data, methods, analyses, and, above all, theoretical framework. Approaching CALL from an initially constructivist perspective, I soon became aware that the complexity of the phenomenon was not only a matter of an individual or a group developing a deeper understanding and discovery of new knowledge through cognitive processes but that the complexity was attributable to the *relations* between teachers, learners and technologies. Moreover, these relations were not fixed entities, recognizable from one classroom to another, but a result of socially and culturally constructed human activities. They are, in other words, situated.

Embarking on the present thesis, my experience as a teacher was supplemented with research experience. Working as a research fellow on the questions that emerged during my years in the classroom has given me a larger and more informed perspective. Also, the opportunity of researching the field of teachers and ICTs has convinced me that it is very much relevant as well as compelling. The combined experience from teaching and research has, I argue,

[92] In her doctoral dissertation on intercultural understanding in EFL in Sweden, Ulla Lundgren (2002) examines three discourses that frame the intercultural dimension; a teachers' discourse, an authorities' discourse, and a researchers' discourse. Similarly, she finds that the latter hardly leaves any impression on teachers' construction of their discourse.

sensitized me to the issues involved and made it easier to reflect on the issues from a double position; both as an engaged insider with the *emic* perspective and through the more detached and analytical researcher's lens that characterizes the *etic* perspective (cf Chapter 4.3.4 below).

The point of bringing such personal experience and concerns to the fore is rooted in the belief "that the very process whereby one interprets and defines a situation is itself a product of the circumstances in which one is placed" (Cohen & Manion, 1994:35). I argue that the researcher who knows the field from the inside shares the advantages attributed to teacher-initiated research in the language classroom as put forth by David Nunan, quoting Beasley and Riordan:

1. *It begins with and builds on the knowledge that teachers have already accumulated*
2. *It focuses on the immediate interests and concerns of classroom teachers*
3. *It matches the subtle, organic process of classroom life*
4. *It builds on the 'natural' processes of evaluation and research which teachers carry out daily*
5. *It bridges the gap between understanding and action by merging the role of the researcher and practitioner (…) (Nunan, 1989:3)*

4.3.2. Voice and signature

Having identified these 'personal' components in the present study, the question arises as to how they influence it. Playing down personal stakes disguises obvious socio-political agendas a researcher might have, resulting in the image of the detached observer with a sterile but 'true' account of the phenomenon researched. The findings in this study are a result of interaction between the teacher and researcher identities found within myself as well as myself and participating teachers. In sum, my findings are socioculturally and jointly constructed. Although this does not necessarily mean adopting a first person narrative it brings up questions of voice and signature:

> *Though researchers' internal conditions of experience have tended not to play an important role in research and have often been consciously silenced through such conventional writing expressions as 'this research' or 'the researcher', researcher voice and signature are now recognized terms in personal experience methods. Who the researchers are makes a difference at all levels of the research, and the signature they put on their work comes out of the stories they live and tell (Clanindin & Connelly, 1998:171).*

A voice can signal values both through speech and silence. In addition, a voice may represent more than one speaker, e.g. the voice of the researcher and the voices of participants s/he chooses to be heard. These considerations have a direct bearing on the choice of pronoun in this study. Except for this and the previous sub-chapter, the researcher is referred to in the third person. This is not to adopt some 'objective' stance but to acknowledge that the researcher's voice may speak in different modes and should be treated as one of the many voices that are articulated throughout this study, cf. the discussion in Chapter 5 on the survey as a multivoiced narrative.

Having acknowledged the presence of voice, the question of signature arises. A research signature is part of the research discourse, the notion of 'being there' adding to the author identity of the study: "Too vivid a signature runs the risk of obscuring the field and its participants; too subtle a signature runs the risk of the deception that the text speaks from the point of view of the participant" (Clanindin & Connelly, 1998:173).

In sum, *voice* is a discursive element that is polyphonous; it belongs to more than one identity or agent. *Signature* is my rhetorical mark on the present text; vocabulary, phrasing, coloring etc. Together, voice and signature are discursive elements that play an important part in transferring unstructured and structured data from the field to the research text.

Sharing the classroom experiences of the teachers studied in Chapter 6, coaching participating teachers in *The Tower* (the in-service training course studied in Chapter 5), and my years of practice as a teacher and researcher thus add up to a view of the research field that obviously makes me approach the field with a certain perspective. This perspective will also contain attitudes, beliefs, and intentions and, consequently, the presence of perspective provokes the question of bias.

4.3.3. Bias

The question of bias facing researchers sharing the culture of the research field is not new. Such concerns become hard to tone down or even conceal when taking on the research process and – even more so – writing the thesis. My belief in the value of technology in education, and my interest in teachers' well-being and optimal working conditions may be obvious. My critical attitude towards some educational policies may not[93]. Moreover, my wish to influence the use of ICTs in teacher education and in-service training in the direction of less instrumental and more situated, relational, and reflective practices adds an Action Research dimension to the present study. To conceal such interests and attitudes would be unethical. My observations are as culturally and historically situated as those of the reader but while they are obviously subjective, I argue (along with Kumar) that they do not automatically amount to bias:

> *Subjectivity is an integral part of your way of thinking that is conditioned by your educational background, discipline, philosophy, experience and skills. Bias on the other hand, is a deliberate attempt to either conceal or highlight something (Kumar, 1996:6).*

In other words: the present account is seen through the eyes of a human trying to construct a picture that is not intentionally retouched (also cf Chapter 7.4 on validity).

4.3.4. Emic and etic perspectives

I regard my position as teacher and researcher, insider and observer, to be close to the *emic/etic* dichotomy described by Denzin and Lincoln:

> *There are two types of interpreters: people who have actually experienced what has been described, and those who are often ethnographers, or field-workers, or so-called well-informed experts. (…) Local interpreters use experience-near concepts – words and meanings that actually operate in the worlds studied (Geertz, 1983, p.57). These individuals seek emic, or contextual, situated understandings. Scientific interpreters frequently use experience-distant terms – words whose meanings lie in the observer's theory (…). They produce etic, or abstract, noncontextualized interpretations (Denzin & Lincoln, 1998:325).*

The two positions may represent tension, but they may also be complementary. For the "researcher as *bricoleur*-theorist [who] works between and within overlapping perspectives and paradigms" (Denzin & Lincoln, 1998:4), it represents more opportunities for discovering

[93] For instance, I wholeheartedly agree with Linda Darling-Hammond (1990) and Andy Hargreaves (2003) who criticize increasing bureaucratization in education and describe how it inhibits teacher professionalism.

and recognizing meaningful relationships in the world studied. With my teaching experience, my work in ICT-related projects and role as one of the coordinators of *The Tower*, the emic position is the primary one. My assumption is that the emic perspective is needed in order to understand the experiences of people whose social interactions constitute the phenomenon studied. The issue at stake is *who is imposing whose reality on whom*, and it is probably impossible to answer this satisfactorily – at least within the scope of this study. Being aware of how the analyst acts on the context and how the context acts on the analyst is as far as the issue can be pursued here.

However, an emic position may run the risk of becoming myopic. "Going native", the failure to distinguish between the etic and the emic perspective and the proximity to the field threatening the integrity of the researcher, is a dilemma in qualitative research and might weaken the validity of the study. As a researcher I was looking for more of a bird's eye view of a sample of teachers to complement the up-close, insider's view. The question of *to what extent* attitudes and beliefs were shared by teachers who worked with ICTs in EFL became a major concern. I believed research on such issues would capture important aspects relevant for teacher education and in-service training that might escape an exclusively emic perspective. *The Tower* represented an opportunity to conduct this kind of study, although my role as coordinator gives this part of the study a semi-emic flavor as well. I can identify with Tashakkori and Teddlie's assertion that

> *(…) even when inferences are based on highly systematic quantitative data, personal observations of the context of data collection as well as interactions with the individuals who are the sources of data are valuable sources of information (Tashakkori & Teddlie, 1998:110).*

The above account describes my journey from being a user of technology in EFL to becoming a researcher of technology in EFL, my endeavors towards finding methods conducive to this kind of research and a position to conduct research from.

4.3.5. Polyphony and power

In many ways, the present study is an analysis of voices. They are teachers' voices, heard through diverse channels and in different genres: social interaction, interviews, online discussion forum, and questionnaire. But these voices are mediated by the researcher's interest, subjectivity, perspective and aims – in short the researcher as a filtering mechanism and as one who selects, decides, presents. There is absolutely no way data can be presented without being laden with assumptions, theory, and values. However, I argue that if we as researchers explicate our procedures and our suppositions, it is science. Consequently, this section has explicated the researcher's role in the present study so that his voice should be one of the many articulated voices heard when reading it. Although it is not brought to the fore in the form of personal pronoun, opinion, or comment (except for the present section of the study), it is part of the choir and should be recognized as similar to the voice of a director of a movie, a choreographer of a ballet. This means that there is an element of power present; over the material chosen, its form and the reader who reads it. One example of such power play is the choice of metaphor.

4.4. Metaphor

4.4.1. Introduction

A literary device, metaphor, is the backbone of social science writing
(Richardson, 1998:351, emphasis in original).

Education is a field with an abundance of *metaphor* (from Greek: *metapherein* - to transfer): *input - output*, *learning strategies, building knowledge, communities of practice* to name just a few that relate to the very different worlds of logistics, military campaign, construction work, and socialization. They invoke different perspectives, different values, different approaches, and different epistemologies. Metaphors are instrumental in propagating what we take as indications of learning: *result*, *score, competence*. They relate to different theoretical perspectives on learning and teaching, indeed the terms learning and teaching are themselves metaphoric expressions of complex processes. In a sociocultural perspective, Vygotsky's Zone of Proximal Development (ZPD) is a key metaphor that serves to emphasize the role of participatory learning. Metaphors are also 'user-friendly' in the sense that they popularize and abbreviate complexity into easily accessible, 'folk' terms. Besides, using metaphor "is a way to achieve more integration among diverse pieces of data." (Miles & Huberman, 1994:245). Miles and Huberman (op.cit.:251-52) attribute a series of qualities to the use of metaphors that are relevant for this study:

- Metaphors are *data reducing devices* since they take several particulars (norms, rituals, qualities…) and make them into a whole
- They are *pattern-making devices* since they are used regularly
- They function as *decentering devices* since they place some analytical distance between phenomenon and metaphor
- They represent ways of connecting findings to theory (e.g. 'teacher as designer' points to a certain socioculturally generated activity or social process as a core concept)

Where mathematicians and natural scientists may use equations and formula to give a condensed worldview of a phenomenon, social scientists may turn to metaphor. Consequently, the struggle for, and the battle of, metaphors is a very real one with implications for the scientific as well as the lay community.

In *Metaphors we live by*, Lakoff and Johnson (1980:232-33) propose searching for appropriate metaphors in order to make sense of the world and our place in it. They suggest that "we seek out personal metaphors to highlight and make coherent our own pasts, our present activities, and our dreams, hopes and goals as well". These metaphors may be understood as socioculturally constructed mental artifacts that help reproduce our concepts of e.g. educational practices (cf metaphors of cognitive and sociocultural perspectives in Chapter 2.2.6).

With the advent of digital, networked technologies and exponential growth in digitally accessible information, new metaphors emerge, aiming to capture some essential aspects of teaching and learning in the 21st century. In this context, *metaphors become sensitizing constructs.* When they are put to use, as in the present study, they also become part of the research design, and in two ways. Firstly, they impose a certain perspective on the research processes and the phenomenon under examination. Secondly, they represent a structural element in the present study; they are not illustrations but used to relate components to each other. Metaphors such as *ecology*, *interface,* and *design* are used to capture the complexities involved.

In the two following sub-chapters, we see how metaphors that capture technological aspects gradually have come to include social aspects and consider the latter as primary. This might

be considered to dovetail with the changing role of ICTs in learning and teaching (cf Chapter 3.6).

4.4.2. Technology and Ecology

The social impact of technology is hardly ever questioned, but its value is. We have a plethora of dystopic visions like Karel Capek's *R.U.R.* (*Rossum's Universal Robots*, 1920, where the Czech word *robota* meaning 'work', 'drudgery' and 'servitude' was introduced) and *War with the Newts* (1936) where man's creation turns on himself like in Mary Shelley's *Frankenstein* (1818) and Philip K. Dick's *Do Androids dream of Electric Sheep?* (1982, later made into the movie *Blade Runner*). Alienation in the face of technology is treated humorously in Chaplin's *Modern Times* (1936) and not so humorously in Fritz Lang's *Metropolis* (1927). These are but a few 'classic' references to instances where technology is cloaked in images of life forms, tools or systems. However, references to the role of technology in education are less common.

Turning to the age of digital technologies, the social impact of technology is no less a crucial issue and now education is often at the center of attention. One example of this and where metaphors are analyzed is a volume by Nardi and O'Day (1999). Here they discuss several metaphors for technology; *tool*, *text*, *system* and *ecology*.

Technology as Tool is associated with people's ability to control technology, their possibilities of learning, using and exploiting the qualities designers of the technology put into it (cf *genotype* and *phenotype* in Chapter 2.3.3). In many ways, the tool metaphor is related to technology as prosthetic devices, as supplements to the body, ultimately bringing about the convergence of man and machine, the tool and the user. While these are all important factors in appropriating technology, the tool metaphor does not capture the larger social context the technology is embedded in, and which may give it different meanings and affordances.

Technology as text is a metaphor that enhances technology's communicative properties, "a carrier of meaning as the technology passes through different social situations" (op.cit.:31). But although different (groups of) people may manipulate the intended use of technologies, their intrinsic intentionality and authority are still prescribed by the designers. Consequently, while transcending the limitations of the tool metaphor and placing more weight on interpretation (and thereby accounting for the discrepancy between intended and actual use), the text metaphor does not include human action to its full extent. "… the metaphor doesn't tell us how people's judgment, creativity, and values can or should come into play when they choose to act" (op.cit.:33).

Technology as system is a much more comprehensive metaphor, giving technology the powers of an all-encompassing rationality that integrates everything in its way. Technology as system is autonomous and cogent, but subtle or invisible – like a *web*. This is the metaphor for many of the dystopian visions and suitably so since it makes man a pawn. The systemic qualities of this metaphor may also attract policy makers because of its societal scope and financial/organizational aspects, but it does not address the ecology of the smaller educational units, groups of learners, classrooms, communities of teachers etc.

Technology as Ecology, Information Ecology, Ecosocial Systems are metaphors that seek to capture what seems to escape the previous three. They reflect the transition from seeing technology as add-ons or self-contained systems to seeing technology as processes, culture, space, and environment. Boundaries between individuals, groups and environment may blur

in ecologies. Still, individuals and their environments do not form an analytically inseparable unit; they are interrelated and mutually constitutive for the ecology.

The organic qualities in an ecology metaphor are well suited to capture the sociogenetic qualities of mind (cf. Chapter 2.2.2) and the Vygotskian tradition of seeing the relations between individual, collective and contextual factors as a unit of analysis. Ecology in this sense is removed from its biological origin and takes on cultural a meaning. In such a 'cultural ecology', contexts, artifacts, individuals, and collectives are woven together as "human actions in concert with and as a part of the permeable, changing, events of life" (Cole & Wertsch, 1994:3). This is a view that was also echoed in the discussion on van Lier's ecological approach to language learning in Chapter 3.5.1.

Nardi and O'Day offer the following definition of an information ecology:

> *We define an information ecology to be a system of people, practices, values and technologies in a particular local environment. In information ecologies, the spotlight is not on technology, but on human activities that are served by technology (Nardi & O'Day, 1999:49).*

According to this definition, hospitals, libraries, schools and classrooms are examples of information ecologies. However, these are all physical, co-located settings. While Nardi and O'Day do not explicitly touch upon the online setting, there is no reason why such settings do not qualify as information ecologies or, rather, as an integrated part of ecologies. A notion of locality can be found online, an environment scaled to or constructed by its participants can be found online, humans helping humans using technology is very much an online phenomenon, and online environments respond to intervention and changes in key species – all characteristics of an ecology. Consequently, physical and virtual dimensions are mutually constitutive to an information ecology. Physical and virtual dimensions co-evolve as human activity unfolds at the interface between the two.

Jay Lemke (2000) uses a metaphor of *Ecosocial system* to capture interactions between humans and non-humans, "species and abiotic elements". To Lemke, the dynamics involved are essential: "an Ecosocial system is a system of interdependent processes; an Ecosocial or sociotechnical network is described by saying what's going on, what's participating and how, and how one going-on is interdependent with another" (op.cit.:275). This metaphor is used by Lemke to analyze schooling in relation to identity and culture development. Such a 'humanist' or 'social science' approach to the ecology metaphor will guide the view of information ecologies that follow.

An ecosystem is often vulnerable, whether it is a coral reef or a community of teachers. If a new element is introduced, it may endanger the viability of the system and the same is true if a key element is removed. An illustration of the former is when digital technologies are introduced in schools and of the latter when the school's prime mover, enthusiast and/or computer-savvy individual disappears (Erstad & Trandheim Røn, 1998). When teachers know how to fit technology to the local circumstances, whether at classroom, school or regional level, they become mediators in the sense that they are essential to the well-being of the information ecology. They prepare the *habitation* of technology within a network of relationships (Nardi & O'Day, 1999:55) and then manage to negotiate, work in, and develop that information ecology.

As stated under research questions (cf Chapter 1.2), the present study aims to describe and analyze what it means for teachers to work in technology-rich environments, i.e within

information ecologies where "Through broad participation, different people in an ecology give it form and meaning" (op.cit:129). Through activities involving artifacts, new artifacts emerge; physical, conceptual, and metaphorical. Also, elements of an ecology meet, converge, diverge, and form boundaries and interfaces (cf the caption to Chapter 1). The Interface is the second main metaphor used to guide this study.

4.4.3. Teaching at the Interface

The teacher is a keystone species in the ecology of the classroom. But it is crucial to keep in mind that "an information ecology, unlike a biological ecology, is *designed*" (Nardi & O'Day, 1999:182, emphasis in original), and "What makes information ecologies different is the need to apply human values to the development of the practices and technologies within the ecology." (op.cit.:211-12). The teacher is the designer of educational opportunities in the information ecology, while at the same time s/he is part of the design. In both cases s/he traverses the interfaces of culture, education, policies, and technology. Practices and artifacts co-evolve. This means that in the present study, the interface metaphor is not restricted to the domain of ICTs but used whenever teachers find themselves mediating between e.g. different discourses, between activity systems, and between traditional and new literacies. But it is within the domain of technology that the interface is most commonly associated with metaphor:

> *What exactly is an interface anyway? In its simplest sense, the word refers to software that shapes the interaction between user and computer. The interface serves as a kind of translator, mediating between the two parties, making one sensible to the other. In other words, the relationship governed by the interface is a semantic one, characterized by meaning and expression rather than physical force (Johnson, 1997:14).*

Within the technological domain, the first task of the interface is to represent technology itself. As such it is a physical artifact. It has become infused with historically accumulated human competences and insights that now have become externalized. For digital technologies this externalization comes in the forms of metaphors by way of signs embedded in print and graphics.

Designers have come up with vocabulary and icons that translate the interior of the computers, its processes and the spaces it occupies. But Johnson sees the interface as something more than just a translator of technological processes into familiar semiotics, it is a zone where technology is united with culture and the artist is united with the engineer in the design of it. Consequently, an extended notion of literacy is needed in order to make sense of such interfaces. According to Johnson, currently the computer interface consists of the *desktop*, the *window*, the *link*, the *text*, and the *agent*. Together they form a model of technology, i.e. a set of metaphors that convey a particular view of technology. These metaphors also take on the quality of artifacts, conceptual tools that mediate our understanding of ICTs. They are spread across languages, used without regard to social position, and therefore important because they, thus, perspectivize ICTs in education.

The Desktop. The key to understanding the computer interface is the *desktop* metaphor. As the prime symbol of post-industrialism it imparts a feeling of organized, white-collar, corporative space with trash cans, file cabinets, and objects we choose to have within grasp. This metaphor is responsive to some manipulation, but is cool, detached and unsocial. The farm, factory, building, or village metaphor might have better possibilities of capturing social networks, but the pre-Internet computer desktop interface focused on perception and cognitive ease and is still the dominant type. The desktop metaphor is likely to be challenged by others,

including three-dimensional, more transparent metaphors in the near future. This means that a very much 'objectified' quality may be replaced by a more process- and activity-oriented one.

Another aspect of the desktop metaphor, and indeed of all interfaces, is its inherent ideologies. Partly treated by Sherry Turkle (1995) and more explicitly by Cynthia L. and Richard J. Selfe (1994) the desktop interface is seen as mapping sociopolitical landscapes and representing linguistic contact zones with asymmetrical power relations. To Selfe & Selfe, the computer interface, and in particular the desktop, is constructed from dominant forces in Western culture with its corporate-capitalistic orientation, discursive powers associated with English as a global language, hierarchical and rationalistic logic, and male values. With this orientation, the interface might frame the user in a particular ideology instead of enabling agency on part of the user.

Consequently, critical literacy becomes imperative when operating at the interface. It is not enough to learn technology, it becomes imperative to engage in the design to adapt, transform, and transcend its ideological constraints:

> *English teachers cannot be content to understand the maps of computer interfaces as simple uncomplicated spaces. Rather, we need to prepare ourselves and the students with whom we work to map these virtual spaces as sites of "multiple and heterogeneous borders where different histories, languages, experiences, and voices intermingle amidst diverse relations of power and privilege" (op.cit.:14).*

This view also points in the direction of the *teacher-as-designer* metaphor (cf Chapter 4.4.4 below).

The Window. While the desktop introduced order in the form of fixed or transient icons, menus, and scroll bars the window introduces the spatial dimension. It embodies the multiple viewpoint or the fragmented vision, the opportunity to lead parallel lives, and engages the viewer in multiprocessing of stimuli. Amidst this seemingly anarchic, dislocated, multiple information display of the window the desktop metaphor brings some order, but not flexible guidance as to what to exploit for a particular assignment. It depends on the way the window is appropriated by teachers and learners and the way windows are linked and aligned by the user. Consequently, windows – as in the case of the link (below) – carry epistemological implications.

The Link. The third component, the *link*, is the single most important element of the interface because is instrumental in constructing relationships between multiple windows and the user. The hypertext as envisioned by Vannevar Bush (1945) and Ted Nelson (1974) has the link as the central grammatical category, a flexible conjunction drawing semantic connections between elements within a singular document or between a plethora of files. The link demands navigational skills and hypermedia literacy. It is a hidden rhetoric that expresses and betrays biases, invite and manipulate (Burbules & Callister Jr, 2000:84). But even more important may be the link dismantling the distinction between author and reader. By choosing to follow hyperlinks or not, the reader constructs a version of the material that may be far removed from the initial document provided by the author. The line between designer and the designed, between author and reader becomes blurred and opens up for new participatory opportunities and practices. The link emphasizes *connections* between chunks of information. The curriculum organized around topics, modules, and progression is challenged by the complexity of hypermediated material.

The Text. As suggested by the window and the link, reading and writing at the interface can be a three-dimensional, multimodal experience. Text consists of font shape and size, color, background, and is integrated with emoticons, graphics, animation, sound and video. It is mutating into new genres such as the web page, email, and SMS. The word processor has changed the way we conceptualize writing from thinking, then writing, to typing and thinking processes overlapping (Heim, 1987). For language learning and teaching, the changing face of text is truly a challenge.

The Agent. So far, interface components have largely been under control of the user. However, the *agent* points towards as a more persistently active component of the interface. Agents may come in the form of windows opening automatically, web sites triggering email messages, downloaded software regularly notifying the user of updates and program-related issues, and anthropomorphic BOTs ("Chatterbots") or 'Avatars'[94] (programs in the form of robots. Some appear with 'human' qualities, taking on the role of guide, conversational partner, therapist, friend etc. Socializing with non-human entities becomes part of living, working, and learning in digitally networked environments; i.e. there are epistemological issues involved. Also, this perspective makes agents intriguing with regard to language learning[95].

Although this is not the place to discuss the historical development of the interface[96], it is noteworthy that its function has gone from translation to socialization, from representing processes to opening opportunities for interaction. This represents a move from the computer as cognitive tool to the computer as social process. Still, the desktop interface and its components cater first and foremost to individual needs:

> *For a long time, the interface medium has concentrated most of its energies on the individual, for understandable reasons. The personal computer was just that, a personal computer. (…) The desktop metaphor is by definition a monadic system; it belongs to the individual psyche the way Freud's case studies do, and that inwardness can make it harder to think in more social, more communal terms (Johnson, 1997:222).*

But interface designers have come to think less in terms of 'computer centrism' and more in terms of social action:

> *Jonathan Grudin, who has written about the historical continuity of interface design (1990), found a continuing, phased development "outward" from the hardware: "there is a continuity to the outward movement from the computer's interface to its external environment, from hardware to software to increasingly higher-level cognitive capabilities and finally to social processes" (Kuutti, 1996:23).*

Such processes and activities are the ones crucial for teachers, literally working at the interface of an 'external environment' and computer-generated representations and

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[94] Avatar is a commonly used term for 3-dimensional representations of humans in computer games. The etymology is interesting because of its religious connotations: Sanskrit *avatara:* descends from, *avatarati:* he descends, from *ava-* away + *tarati* he crosses over, thus invoking the apparition of an angelic entity.

[95] The present researcher has some experience staging conversations between young learners and BOTs. Although BOTs display mostly lacking or rudimentary conversational skills, there were truly rewarding experiences, and the learners expressed belief in their potential as conversational tools conducive to language learning.

[96] An account of the text-based and the graphical user interface from a humanitarian and post-modernist perspective more than a technical one is found in Sherry *Turkle's Life on the Screen. Identity in the Age of the Internet* (1995).

constructions. Sense making, communicative actions, constructing and sharing knowledge need interfaces that transcend the simple desktop metaphor. One could, hypothetically, imagine the 'perfect' interface accommodating all individual and social practices involved in learning and teaching. However, it is hard to see this happening from a design perspective. Life and social interaction can hardly be designed in full. An interface, no matter how sophisticated, will need a human mediator in its midst. Teachers are such mediators. They have, in fact, always had a mediating role. But this mediating role has been interpreted differently according to which metaphor of learning that has been applied; transfer, construction, or participation. When online environments meet classrooms, the mediator is required to take on the role of designer of activities, situations, tasks, and assignments conducive to learning in such 'extended' and complex contexts (for numerous examples, cf Chapter 6). Such designs cannot be supplied by the textbook/workbook, the targets in a curriculum, software packages or (hypothetically) the perfect interface alone. The teacher must become a designer as well as a key species within the design. Learner – technology interaction is not enough.

This overview of some ICT-related metaphors shows that it is important which metaphors are chosen to popularize and encapsulate relations between humans, technologies, and contexts. To summarize, *the teacher works at the interface as a mediator and is also part of the learner's interface between an external world and one of digital representations*. Based on analyses of classroom episodes and designs, Chapter 6.5.3 expands on this notion of the teacher as interface.

4.4.4. Teacher as Designer

The interface and design aspects touched upon in the previous pages are brought to the fore when technology becomes part of the learning environment to be designed. In the article *Teachers as Designers of Collaborative Distance Learning* (Spector, 1999) the author starts out by stating "I shall emphasize the need to empower teachers to become designers of such environments" (op.cit,:1). The environments referred to are "technology-mediated learning environments", and although they are linked to the field of distance learning, the relevance for other technology-rich environments is high.

Spector draws on cultural-historical theory and activity theory and applies an ecological perspective, terming his own "integrated". His unit of analysis goes beyond the individual learner and he describes this integrated perspective by placing the learner as a member of a society or language community: "Living consists of working and learning, which are viewed as essentially collaborative efforts to achieve commonly held goals" (op.cit.:2). These efforts are studied when they take place in complex systems that exhibit dynamic behavior (delays, non-linearity, uncertainty etc, all typical of technology-rich environments), but according to Spector, we have "failed to improve our thinking skills in complex domains" and "we have not fully integrated relevant principles about human learning into design praxis" (op.cit:3). The 'we' Spector refers to are instructional scientists, and he makes the following concession:

> *At this point I might simply say that we, as instructional scientists, have not fully understood the socially-situated learning perspective and its implications for human learning in and about complex systems. There is a great deal of discussion about situated, problem-based, and collaborative learning, but we are missing critical pieces of a design framework. Put differently, I believe that we lack a well-articulated design framework with sufficient detail to take us from socially-situated, problem-based, collaborative learning perspective to the design of a particular learning environment for a particular subject domain (op.cit:4).*

The last sentence is seductive in its belief that a missing technological link will solve the problem addressed. It is, in essence, a technologist and not a social approach to learning a subject. To the present researcher, the "missing critical piece" would rather be the teacher contributing subject authority as well as relational expertise (cf Chapters 3.11 and 6.10) to the many possible interactions between teachers, learners and technology. Interaction at the interfaces of culture, language and technology constitutes the notion of the teacher as designer, as used in this study. It is not sufficient to be a facilitator, bridge or midwife. Even though these roles are important, they refer to the teacher being part of the design or the *designed*. But with the software and hardware tools available, the teacher is also cast in the role as designer, an active participant in constructing situations and activities conducive to learning. It is easy to agree with Spector when he concludes that:

> *I believe that there is great promise in designing collaborative telelearning environments from a socially-situated learning perspective with heavy emphasis on collaborative learner participation in the creation of knowledge objects and artifacts. Furthermore, I am convinced that teachers can participate much more actively in the design of and implementation of these environments (op.cit.:13).*

While this study subscribes to the above view, it does not restrict this view to telelearning environments but applies it to technology-rich environments in general and in particular where co-located, physical learning environments (e.g. classrooms) intersect with digital, networked, and online opportunities for learning. This is one type of interface. Secondly, this study wants to concentrate on a subject-specific domain of EFL as a critical piece of the design. Where a particular school subject intersects with partly 'digitized practices' constitutes another type of interface, and one that has to be negotiated by teachers.

4.4.5. Validity of metaphor

The previous sections have dealt with metaphors as a means of capturing important aspects of the research question. The reasons are found in the metaphor's powerful quality of infusing the object it refers to with certain qualities the researcher might want to bring attention to. It is, obviously, a biased exercise; "…metaphor is often considered as an area where descriptions are being used performatively. Literal descriptions may just be telling it how it is, while metaphorical ones are doing something sneaky" (Potter, 1996:180). That this distinction does not hold true (as Potter shows) is seen in the way 'literal' language is impregnated with metaphorically derived words and constructions (e.g. *clear*, *muddled*, *rich*, *poor*). Also, the alternative to metaphor is never a neutral, value-free term but another perspective cloaked in a particular choice of words. *School*, *education* and *technology* are in themselves metaphors and the qualities people associate with them are built into them and institutionalized there. These qualities are reproduced in the use of language, until they are challenged by new qualities felt to be meaningful by the participants constituting a particular information ecology.[97]

The primary metaphors guiding this study, *ecology*, *interface*, and *design* are chosen because of their capacity to capture social interaction, plasticity of components and human agency. If anything, learning and teaching in technology-rich environments are not predictable; not just a matter of gaining instrumental mastery of tools, not just interpreting technologies as they make their impact on education, not just recognizing the systemic qualities of technology.

[97] Mayor and Swann (2002) discuss the metaphoric qualities of everyday English words (like e.g. 'hours' and 'days') in relation to learning English in distributed online environments and how they develop local forms in different contexts, i.e. they are appropriated according to the sociocultural settings.

Rather, making sense of learning and teaching in technology-rich environments seems to benefit from metaphors that place technology in the midst of communal practice.

> *In ancient Greek, interface (prosopon) means literally a face that is facing, or toward another face; it refers to a living mutual relationship that is itself a third state of being. The ancient word was a source of religious awe and mystical meaning in the description of the nature of a Trinitarian Godhead in which the Father and the Son subsisted together in the interface; the ancient religious word described a relationship between time and eternity. Interface, employed in the environment of computer writing, is the technical name for the physical connection and the electronic circuits that connect the computer to a peripheral: in this context, adapter is another name for interface (Heim, 1987:93-94).*

The purely religious and technical connotations aside, the *'living, mutual relationship'* is the key factor in this study's use of the interface metaphor. It is, like all metaphors and interfaces, historically and socially constructed, here with a view to capturing processes when learners and teachers negotiate some of the many intersections formed when language learning and technology meet. In this study, intersections are formed where subject matter (EFL), technology, and didactics meet and form an interface of high complexity.

4.5. Research Design: Mixed Methodology

> *"You researchers are so dumb. You ask on your questionnaire about what we believe, but not [about] what we* do*!" The sociologist was taken aback, realizing only then that, indeed, the fieldwork was focused on action, whereas the questionnaire was designed to capture basic psychiatric beliefs (Strauss & Corbin, 1998:32, emphasis in original).*

The above quote from an account retold by Grounded Theorists Anselm Strauss and Juliet Corbin perfectly nails two central issues in the present section of the study; the interplay and tension between different types of data and the sociocultural tenet of seeking insight and meaning through people's social practices. Also, the above quote points to the methodological difficulties involved in capturing teachers *coming-to-know*. Their cognitive processes as they strive to make sense of and employ ICTs are – at least in part – unique to the individual teacher:

> *To communicate what has been learnt to a researcher, or to anyone else, the individual must translate the process of coming-to know-into language (written or spoken), or visual representations, or demonstrate it through actions or the completion of task (Somekh, 2001:170).*

This difficulty will continue to haunt a research project that makes use of restricted formats for such translations, e.g. a questionnaire. Such a format would seem to offer a poor match for the complex processes involved. Nevertheless, the present study looks upon a questionnaire as an artifact that has certain catalyst or conducive qualities (a mediating tool) when tapping into attitudes and beliefs that are distributed among or 'stretched' over several individuals.

Consequently, the present research project has made use of some quantitative as well as qualitative tools, making the research design draw on diverse types of data. The following sub-chapter will describe a research design that incorporates several methods, and discuss issues of compatibility.

4.5.1. Mixed Method, Model and Methodology[98]

The polarities of quantitative and qualitative research have by many researchers started to be regarded as misleading and counter-productive to gaining insight in the phenomena studied. In their survey of qualitative research, Bryman and Burgess (1999:xiii) observe that, "increasingly researchers are prepared or indeed prefer to employ both approaches within the context of a single research study. There are many ways in which such a mixed methodology approach can occur", and that these ways take on many forms, among which is "complementarity (whereby they are used together to explore different aspects of a research question". They anticipate that "it may mean that the very distinction between quantitative and qualitative research will be undermined" (op.cit.:xlii).

In a chapter on similarities and differences between the paradigms of quantitative and qualitative research, George R. Taylor and Michael Trumbull (2000) conclude that, "There is a move to combine the two approaches by using and collecting both types of data":

> *The human condition is too complex to be regulated to one approach and in some instances, the qualitative approach will best serve the purpose; on the other hand, quantitative approaches will best serve this purpose. The skilled researcher can draw the best from both approaches and combine them (op.cit.:176).*

Taylor and Trumbull apply such an eclectic approach to a purely technical level of research, issues of ontology and epistemology are not treated, methods are not linked to worldviews. While the observations and conclusion may be right, they are not qualified through a discussion of the status of data, relations between the observer and the observed, and the knower and the known.

However, a book by Abbas Tashakkori and Charles Teddlie, titled *Mixed Methodology. Combining Qualitative and Quantitative Approaches* (1998), points to this distinction between techniques and a more holistic view of the research process:

> *We make a distinction between mixed methods and mixed models. Mixed methods combine qualitative and quantitative approaches in the methodology of a study (such as in the data collection stage), while mixed model studies combine these two approaches across all phases of the research process (such as conceptualization, data collection, data analysis, and inference. After an intensive review of the literature, we believe that mixed model studies are the growing trend in the social and behavioral sciences (Tashakkori & Teddlie, 1998:ix-x).*

The mixed model studies combine qualitative and quantitative approaches in multiple ways, but the important characteristic is the way the combined approach permeates the study and is not just restricted to one level of data aggregation or one stage in the research process. The authors distinguish between mixed methodological approaches (in the broad sense), mixed methods for triangulation purposes (rejected as "too limiting", op.cit.:52), and mixed models in which diverse methods are part of *different phases of the research process in a variety of combinations*. Thus, data are not treated dichotomously as belonging in either a quantitative, "hard data" camp, or a qualitative, "soft" data camp but more as dimensions of representation. The present study adopts a similar view and a mixed model approach to the research questions. In the introduction to the present chapter (cf 4.1), Cohen and Manion (1994) were cited on similar views. In their volume on qualitative data analysis Miles and Huberman (1994:40) discuss linking qualitative and quantitative data, and conclude that, "The question,

[98] The relationship between the three was discussed in Chapter 4.1.

then, is not whether the two sorts of data and associated methods can be linked during study design, but whether it should be done, how it will be done, and for what purposes". To summarize, there is ample evidence of research theorists and examples of research favoring mixed method approaches. However, Tashakkori and Teddlie introduce the mixed model as a more principled way of combining methods. The present study draws on this model and also extends it to capture a multi-*level* analysis of data (cf Chapter 4.7.1).

In an overview of the evolution of methodological approaches in the social and behavioral sciences, Tashakkori and Teddlie date the emergence of mixed model studies to the 1990s and with the following generic design:

1. Type of Inquiry – QUAL and/or QUAN
2. Data Collection/Operations – QUAL and/or QUAN
3. Analysis/Inferences – QUAL and/or QUAN

They add that "There must be a mixing such that both approaches appear in at least one stage of the study" (op.cit.:15). This view is shared by Kvale (1996:69) who finds many examples of qualitative and quantitative methods interacting in the practice of social research, and that this is not restricted to the analysis phase. Like Tashakkori and Teddlie, Kvale assesses the value of different methods from "their power to bear upon the research questions asked".

Following the delimitation of the mixed model approach Tashakkori and Teddlie describe various types of approaches. The ones relevant to the present study will be treated after raising the question as to whether such an approach is compatible with the theoretical perspective established in Chapter 2.

4.5.2. Mixed Methodology and theoretical perspectives

Miles and Huberman flatly state that as for quantitative-qualitative arguments "we see no reason to tie the distinction to epistemological differences" (1994:40). They find that linking qualitative and quantitative data provides corroboration of findings, provides richer detail and initiates new lines of thinking as the two approaches may uncover otherwise ignored paradoxes or connections in the data. Specifically, the authors point to using quantitative data:

> *It can help during* data collection *by supplying background data, getting overlooked information, and helping avoid 'elite bias' (talking only to high-status respondents). During* analysis *quantitative data can help by showing the generality of specific observations, correcting the 'holistic fallacy' (monolithic judgments about a case), and verifying or casting new light on qualitative findings (Miles & Huberman, 1994:41, emphasis in original).*

Tashakkori and Teddlie also discuss how certain methodologies have been identified with certain social science paradigms and the "wars" between them, e.g. in the case of positivism/empiricism with its quantitative bias versus constructivism/phenomenology with its qualitative bias. Still, they find examples of and reasons for coexistence both on practical and theoretical levels, eventually grounding principles of mixed methodology in philosophical pragmatism with its roots in John Dewey, C.S. Peirce, Richard Rorty and Donald Davidson. To Tashakkori and Teddlie, the research question takes precedence over method as well as the worldview that may be decisive in choice of method. But unlike Taylor (2000) and Miles and Huberman (1994) they acknowledge the ontological and epistemological implications in choice of method and model.

Pragmatism is used by the authors to justify a search for "what works" instead of what is "true" or "real", an integration of diverse theoretical perspectives to interpret data and the view that "any given set of data can be explained by many theories" (Tashakkori & Teddlie, 1998:13). From a pragmatist perspective, mixed model inquiries share certain key values:

> *These similarities in fundamental values include belief in the value-ladenness of facts, belief that reality is multiple and constructed, belief in the fallibility of knowledge, and belief in the undetermination of theory by fact.*
> *(…)*
> *Thus it can be argued that there is a common set of beliefs that many social and behavioral scientists have that undergird a paradigm distinct from positivism or postpositivism or constructivism, which has been labeled pragmatism. This paradigm allows for the use of mixed methods in social and behavioral research (op.cit.:13).*

Having firmly rooted mixed methodology in pragmatist ontology, the question arises as to what extent a mixed methodology is compatible with a sociocultural perspective. Does a sociocultural perspective share the fundamental values listed above? This question has to some extent been answered in the discussion on relativism in Chapter 2.2.8. However, the sociocultural position needs to be clarified on this particular point before mixed methodology is pursued for purposes of research design. A related question concerns the place and status of quantitative data in a sociocultural perspective. In the present study, this is relevant for the use of a questionnaire and the subsequent statistical analysis.

4.5.3. Is Mixed Methodology compatible with a sociocultural perspective?

There is, of course, no such doctrine as to which research design is compatible with which theory of learning, or which method supports or contradicts a particular perspective. Nevertheless the question of compatibility of perspective and method needs to be discussed since opinions vary e.g. as to whether an empirically based method can be compatible with a postmodern perspective or whether a theory of learning as social interaction is compatible with statistical studies. While the primary guide for this study is the research question, the fit (or lack of) between perspective and method is important as it has consequences for the unity of the study. And while the present study is eclectic in its use of methods, it aims to fuse different approaches in a principled way within a sociocultural perspective. Eclecticism is applied to a methodological level, while the sociocultural perspective is kept distinct from cognitive and behaviorist perspectives on a theoretical level. Research literature shows that this is not uncommon. For instance, in an article on how activity theory (AT) has been applied in three research projects on distributed learning, David Russel (2002:74) writes that, "AT has mainly used qualitative and historical research methods, although all three projects I describe also used some quantitative methods". After addressing the complexities involved in studying the impact of technology, Burbules and Callister (2000:16) conclude that, "Perhaps new kinds of research design, or combinations of quantitative and qualitative research methods will address these problems and help us derive useful information to help think through the complex decisions we face". Both these cases illustrate mixed model approaches from a sociocultural perspective, suggesting that when the object of study is complex and to be studied at multiple levels (e.g. individual, collective, institutional), a variety of research methods may be needed in order to capture relations and dynamics.

One enlightening example is Olga Dysthe's dissertation *Writing and Talking to Learn. A theory-based, interpretive study in three classrooms in the USA and Norway* (Dysthe, 1993). She uses the Bakhtinian concept of dialogism as the theoretical framework for qualitative

classroom research. Within such an interpretive approach, Dysthe makes use of micro-ethnography with its constructionist leanings alongside Grounded Theory with its propensity for categories without the necessary context-sensitivity (according to e.g. Alvesson & Sköldberg, 1994). But rather than dwell on the possible incompatibility, Dysthe makes use of Grounded Theory's potential for generating new theory and describes how this led her to the discovery of monologic and dialogic classrooms (Dysthe, 1993:15), much in the way of abduction (cf Chapter 4.5.6 below). A similar example is Mark Warschauer's study on electronic literacies (1999), which also makes use of Grounded Theory when researching four classrooms within a predominantly sociocultural perspective. (It is noteworthy that it is the *principles* of Grounded Theory that are exploited and not Grounded Theory as a theoretical framework.) Neil Mercer and Rupert Wegerif state (1999:87) that, "Our conceptualization of the different types of talk is generated by a theory of language and cognition which is essentially sociocultural". This does not prevent the authors from using methods associated with pre- and post-test design and statistically analyzed scores. In *Opening Dialogue. Understanding the Dynamics of Language and Learning in the English Classroom*, Nystrand (1997:xiv) perceives of "language not as a vehicle for one-way transmission of knowledge from teacher to student but rather as a dynamic social and epistemic process of constructing and negotiating knowledge". Within this "dialogic lens of sociocultural theory" (op.cit.:xiv) on language and meaning making – similar to Dysthe's dialogic perspective – Nystrand turns to statistical methods and regression analysis in particular: "we did a large empirical study to examine the general effects of dialogic practices on achievement and learning" (Nystrand & Gamoran, 1997:30). 1,100 students and their teachers through 450 class sessions were studied, generating an overall picture of classroom discourse. Three methods constituted the research design; surveys and interviews, class observations and hypothesis testing. Summing up the design, the authors state that:

> *There is clearly a trade-off between research, such as our study, that comprehensively depicts the big picture and examines the general effects, on the one hand, and case studies that examine the dynamics of individual cases and episodes, on the other. Ideally, these different perspectives complement each other. Our large study enabled us to test empirically many widely debated hypotheses about the effectiveness of different instructional practices and discourse environments (e.g. recitation, discussion, small-group work) for learning. (op.cit.:56).*

Without going into studies of effectiveness and hypothesis testing the way Nystrand does, the present study shares this reasoning towards methodological eclecticism within a distinct perspective. Finally, in a volume on Vygotskian approaches to second language research (Lantolf & Appel, 1994), María C.M. De Guerrero (1994) presents a study where descriptive as well as inferential statistics are used. The study is in two phases, the first with a predominantly quantitative approach in the form of a survey, followed by a second phase in which qualitative methods using interviews to obtain more "In-depth 'content' analysis" (op.cit.:87).

But examples alone do not answer all implications of the question raised in the title of this sub-chapter. With the sociocultural perspective's emphasis on activity, interaction, and participation as keys to understanding learning, it might seem irrelevant or at least of marginal interest to include a survey in the methods chosen. Responses to a questionnaire are sometimes accused of being too static, context-free, devoid of action-directed components, a result of pre-defined categories by a researcher, reductionist in their form, and not conducive to understanding practices. But this is the case only if statistical data are *chosen* to be treated as such. The present study acknowledges that quantitative data analysis carries a history of

research associated with the characteristics listed above, but argues that there is no naturally "given" understanding or unanimous agreement as to the way statistical data should be interpreted and understood. Whether information appears in letters or numbers is secondary to the research question as well as the perspective chosen. All data are theory-laden, but not in the sense that they determine questions of ontology and epistemology. Rather, data are theory-laden because they are always interpreted and this interpretation is precisely a result of the perspective chosen and thus instilled in the data. The present study is not trying to combine seemingly contrary epistemologies like the ones underpinning cognitive and sociocultural perspectives. Combining perspectives is eclecticism on a level that might threaten the unity of a study. But data and the way they have been elicited can be contextualized within a particular perspective. Hence, this study argues that even forced choice sections of a questionnaire are fully compatible with any perspective, behaviorist, cognitive, or sociocultural, positivist or constructionist, as long as they are subjugated to and made to inform this particular perspective.[99]

A case, then, can be made for the situatedness of beliefs voiced in the form of responses in a questionnaire. But this situatedness appears on two levels. First, responses are individual voices (although strongly directed by the questions asked by the researcher), articulated on the basis of the individual teacher's lifeworld. This level of situatedness remains hidden to the researcher. However, in a teacher community as in the case of *The Tower*, participants are situated in a particular shared context of an in-service course. This context is not *given* in the sense that it is fixed or presupposes an identifiable belief in the participants. Rather, the context is worked out and shaped by participants adding examples of good practice, negotiating tasks, and discussing relevant issues. Context is dynamic and exists in a two-way relationship with the people who share it. A researcher may see *The Tower* as one type of context from which to elicit information, participants may see it as an opportunity to build an understanding of ICTs in EFL. This situatedness is important to underline since it will not emerge through quantitative data, only a sociocultural perspective will go beyond the individual's cognitive processing of information and tasks, and analyze responses as instances of situated activity. In this perspective, the questionnaire is to be regarded more as an artifact for the participant, an 'object to think with', than as a researcher's precision instrument used to measure discrete items. It becomes an exosomatic tool, albeit rather inflexible, that has the potential of conveying and mediating a collective 'feel' respondents have from participating in the course.

As for the lack of activity-oriented components in a survey compared to data generated from studying teachers at work in the classroom, there might be reasons to view survey data as socially and culturally constructed, - *if they are treated accordingly*. Relations between researcher (composing the questionnaire), respondent (interpreting the questionnaire) and the questionnaire as a mediating artifact amount to one particular form of distributed, asynchronous interaction. The analyst can identify positions and recognize arguments as a

[99] Huberman and Miles offer an entertaining and acute observation on contrasting stereotypes:

> The *survey researcher* is seen as a purposeful, efficient worker who designs instrumentation, marches into a site to administer it to everyone in the sample, marches out, codes and processes the data, and analyzes the output. By contrast, the *field researcher* is seen as a near-aimless loiterer who throws together some orienting instrumentation, hangs around a field site for days, collects all manner of data, fiddles with the instrumentation, talks to some people more than to others, observes without an observation schedule, accumulates pages and pages of words, and then spends days coding and entering them in a complicated homemade chart analysis – and does all this for only one or two cases, to boot (Miles & Huberman, 1994: 105).

general feature of this particular form of rhetoric. However, there is also tension present between the individual voice of the respondent and the collective voice of the sample group.

This tension between the individual and the collective is also found in e.g. cognitive processes like reading. The reader contextualizes the text according to the interplay between herself, author, other texts (intertextuality), institutional expectations (e.g. in a school session), and co-readers (colleagues, friends, acquaintances who come to mind during a particular passage) (Säljö, 2000:220-30). Responding to a questionnaire can be viewed along the same lines of reasoning. It is not the single mind processing and delivering information, but a reciprocal, situated effort in which the individual's responses resonate with the socio-historical setting in which it is embedded and with responses other respondents. The questionnaire's role in a survey is thus one of an artifact mediating some of the teachers' views, opinions and beliefs that are part of their 'tacit knowledge'[100]. It is a way towards identifying 'horizons of meaning (Nielsen, 1995:7), meaning that is shared – to lesser or greater extent – by the sample of participants. This view of the survey as a cultural tool brings it close to a view of:

> *(…) quantitative analysis to be a kind of story (a very condensed one where just different kinds of rhetorical strategies are used in constructing the story. In such a perspective the main difference between qualitative and quantitative research would be the more formalized rules for interpretation that apply for quantitative research, and the fact that the "statistical rhetoric" in our culture is more irresistible than other rhetoric strategies (Nielsen, 1995:11).*

A discussion on the situatedness, multivoicedness, and interactions encapsulated in survey response is important because it points towards the unit of analysis which, in sociocultural theory, is found in different types of social practices. While *The Tower* survey produces data that might be said to be secondary to data collected from classroom interaction, these data say something about possible shared beliefs on a larger scale. This may put the way teachers go about their work in ICT-rich learning environments into perspective.

In conclusion, a mixed model design should not necessarily violate a sociocultural perspective. On the contrary, such a design might be able to analyze a phenomenon across individual, collective, and institutional levels. Methods and data are obviously theory-laden, but just as important is the way they are put to work, what research questions, purposes and theoretical assumptions they are intended to serve.

4.5.4. The Mixed Model design of the present study

Tashakkori and Teddlie describe eight types of mixed model studies (1998:56 ff. gives an overview). These types are categorized according to three dichotomous research dimensions: a) exploratory or confirmatory investigation, b) qualitative or quantitative data collection and operations, and c) qualitative versus statistical analysis and inference. Models are further refined, developed and exemplified and within the "extended examples of mixed model designs" the *sequential mixed model* is found. This is the model used in the present study. It is exploratory rather than confirmatory and characterized by stages that involve either predominantly quantitative or qualitative approaches, "although some degree of mixing might be present in one or more of its stages" (op.cit.:153). While qualitative research often is

[100] 'Tacit knowledge' is a key construct in pedagogy and interpretations are many. In the present study, 'tacit knowledge is understood to mean "personal knowledge embedded in individual experience and involves intangible factors such as personal belief, perspective, and the value system" (Paavola, Lipponen, & Hakkarainen, 2002:3). The authors argue that tacit knowledge is more important than explicit knowledge for innovation.

associated with exploratory investigations, quantitative research has often been associated with confirmatory investigations. The present study, however, uses quantitative methods in an "exploratory mode, it's as if we are trying to solve an unstated or ambiguous problem, which has to be framed and reframed as we go" (Miles & Huberman, 1994:90). Instead of viewing statistics as a one-way reduction of a complex phenomenon, it is treated as one of many ways of getting close to a phenomenon by uncovering certain features. In a discussion of quantitative versus qualitative research and exploratory data analysis, Chong Ho Yu argues:

> *One of the goals of quantitative research is to find the optimal balance between parsimony and goodness of fit. During the process of exploratory data analysis, a careful statistician always goes back and forth to add variables or to take variables out of the model. I see no evidence that statistics is a one way reduction. (…) Exploratory data analysis, which aims at suggesting a pattern for further inquiry, contributes to the conceptual or qualitative understanding of a phenomenon. Although it deals with numbers, the ending point is not statistical figures. Rather the product is the hypothetical insight of the essential feature or pattern of an event. In other words, the major concern is not "how much" but "what" and "how" (Yu, 1994:7-8).*

Placing quantitative methods within a qualitative, exploratory perspective corresponds to the way quantitative data are used in the present study. Table 4.1 (below) shows how the mixed model is adopted and how the stages of the present study correspond to the model.

Table 4.1 Complex Mixed Model Design as applied to the present study.
Left hand column showing the characteristics of a sequential study, right hand column showing the corresponding phases of the present study.

Phase One of the Study Approx. September 2000 – February 2001	
Stage One: Type of Inquiry	Predominantly Quantitative: What are informants' attitudes to and beliefs about ICTs? Qualitative inquiry into online interactions
Stage Two: Data collection/operations	Predominantly Quantitative: Data from a survey on *The Tower* sample and from online discussions
Stage Three: Analysis/Inference	Predominantly Quantitative in the form of descriptive statistics. Qualitative elements in analysis of open-ended questions and online interaction
Phase Two of the Study Approx February 2001 – September 2002	
Stage Two: Type of Inquiry	Qualitative: What practices emerge?
Stage Two: Data collection/operations	Qualitative: Ethnographic classroom study supplemented by interviews
Stage Three: Analysis/Inference	Predominantly Qualitative, some frequency counts

Applied to the present study, Stage one is characterized by a descriptive, statistical inquiry into teachers' beliefs about and attitudes to ICTs in EFL by means of a questionnaire with forced choice as well as open-ended questions. These data were added to by unstructured data

in the form of postings from *The Tower* discussion group. Such information was intended to sensitize the research and researcher towards significant and critical episodes in the ethnographic studies.

Stage two is an ethnographic study of teachers in two classrooms involving data from taped interactions, informal talks and semi-structured interviews. This means that there are several types of data underpinning the study. The various types of data yield complementary information by tapping into different dimensions of the research issue. A survey alone may easily destroy the local significance of the individual case and result in a bland set of generalizations that do not apply to any specific case in the sample. On the other hand, going for the larger picture in the form of a survey is like casting a net and see where it tightens, adjusting for "radical particularism" (Miles & Huberman, 1994:173). This is the well known "tension between the particular and the universal: reconciling an individual case's uniqueness with the need for more understanding of generic processes that occur across cases" (op.cit.:173). The implication is that both methods must be used and assessed on their own terms.

4.5.5. Bricolage[101] and the crystal as methodological metaphor

According to Tashakkori and Teddlie, a multimethod approach is an alternative to triangulation. Instead of triangulating data to capture a fixed point, an "objective item" or "truth", typical of positivist and post-positivist oriented approaches, a mixed methodology takes the pragmatist approach to social phenomena. It acknowledges the existence of an external reality but that we may not be able to pin it down or determine it once and for all. Consequently, the research question and the desired outcomes of the inquiry guide the study through an array of eclectic models but with the researcher as the omniscient force:

> *Thus pragmatists decide what they want to research, guided by their personal value systems; that is they study what they think is important to study. Then they study the topic in a way that is congruent with their value system, including variables and units of analysis that they feel are the most appropriate for finding an answer to their research question (Tashakkori & Teddlie, 1998:26).*

To the present researcher, placing the values of the researcher at the center of epistemology brings the pragmatist approach too close to a relativist position (although this would be probably be rejected by pragmatists because of the inherent checks and balances they find in the mixed model methods).

As already discussed in Chapter 2, a sociocultural perspective acknowledges the existence of reality while rejecting our possibilities of representing it in a value-free and objective way. However, where some pragmatists try to escape relativism by its complementary methodologies and explicating the values of the researcher, a sociocultural perspective places greater emphasis on the historically and socially generated *embeddedness* of the phenomenon studied. Phenomena are linked to historical, cultural, and social relations and how these are acted out. From the ontological and epistemological discussion in Chapter 2.2.7 it is clear that traditional triangulation aiming for confirmation through convergence and accuracy is not seen as conducive to capturing the richness, relationships, ambiguity, and *bricolage*-like qualities in the present research issues. At the same time, this study aims at avoiding a

[101] The term *Bricolage* is attributed to Claude Levi-Strauss who used it in his book *La Pensée sauvage* (1962). According to Levi-Strauss, the *bricoleur* performs her tasks with materials and tools that are at hand, from odds and ends. *Bricolage* implies creating structures by means of events.

postmodern, eclectic and surface-oriented methodological approach. The balance is sought by using some of the more postmodern constructs while grounding them in social processes.

Bricolage or *tinkering* is often used in postmodern approaches (but not exclusively so) to research (Denzin & Lincoln, 1998) and learning about the world (Turkle, 1995, building on Lévi-Strauss). It is also used to capture children's use of computers (Papert, 1996, building on Piaget) and learners' approaches to language learning and CALL (Debski, 1997, building on Turkle). Recently, researchers have begun to discuss the epistemological implications of *bricolage* as a form of "performance epistemology" within a sociocultural framework (Lankshear, 2002, see also Chapter 2.2.7). What may seem to distinguish one reading of the metaphor from another is the degree of overall plan, intuition and/or serendipity attached to it.

In the present study, bricolage or tinkering is understood and used in the research process as "a pieced-together, close-knit set of practices that provide solutions to a problem in a concrete situation" (Denzin & Lincoln, 1998:3). But it also reflects the epistemological implications of "knowing as an ability to perform" (Lankshear et al., 2002:33), and relate the various pieces to a complex whole of the social worlds that are studied. In this sense, the concept of *bricolage* is intended to avoid the horizontal maneuvering among surface phenomena and relativism the present researcher sees as the limitations of a postmodernist approach. Rather, bricolage is intended to include the social embededdness of the pieces joined in the mixed model approach.

For this purpose, the research metaphor of crystal or prism seems useful. This construct is seen as an alternative to triangulation, screening, sifting and other more postpositivist methods of validation: "Crystals are prisms that reflect and refract, creating ever-changing images and pictures of reality. Crystallization deconstructs the traditional idea of validity, for now there can be no single, or triangulated truth" (Denzin & Lincoln, 1998:279). In the case of the present study, the crystal will reflect and refract inquiries in the form of pre-designed questions, open-ended questions, analyses of online discussion entries, ethnographic classroom observation, and interviews/impromptu exchanges of opinion. The aim is not to pin down some objective reality, the aim is to provide the inquiry with substance and richness, to capture the many dimensions in teachers' encounters with ICTs so that they can be scrutinized, analyzed and used to improve teachers' professionalism and inform teacher education. As for a more detailed discussion on issues of validity and trustworthiness, see Chapter 7.4.

So far, the methodological approach of the present study has embraced a mostly emic perspective, a mixed model design, and a series of metaphors. In the following, questions of deductive, inductive, and abductive approaches to data are discussed.

4.5.6. Abduction

> *In short, abduction creates, deduction explicates, and induction verifies*
>
> *(Yu, 1994:14)*

Swedish authors Alvesson and Sköldberg (1994) have explored the borderland between methodologies and theories of science. From an anti-positivist position, stating that it is not possible to separate knowledge from the knower, the authors still emphasize the value of our experience and empirical data, what we observe. This brings the authors to observations like the following: "Even if statistics on social phenomena often conceals ambiguities and social

norms for classification it can sometimes have a certain value as background material for qualitative research" (op.cit.:11, my translation). Instead of engaging in an argument on qualitative versus qualitative methods, the book advocates "reflective empirical research", defined as "how various linguistic, social, political, and theoretical elements are interwoven in the process of developing knowledge within which empirical material is constructed and interpreted" (op.cit.:12, my translation). One way of going about this is to make use of *abduction*. This model is different from deduction and induction while holding characteristics of both.

Deduction uses a specific rule to explain a multitude of cases. It is normative in its categorization, ascertaining assumptions rather than explaining patterns or similarities. In a way it is 'an educated guess' with little to deduce from, often associated with corroborating or falsifying findings. Induction, on the other hand, is a process where a rule or pattern emanates from observing a series of phenomena and is made valid for still more (so far) unobserved phenomena. It implies a risk in going from the particular to the general and it implies some reduction of the richness of observation in distilling these into a rule. It lends itself more to accumulating observations than generating theory (although proponents of Grounded Theory might reject this claim). Condensing empiric material alone cannot develop theory. Trying to make use of the best of both deductive and inductive worlds, *abduction* is gaining interest as a viable alternative.

Alvesson and Sköldberg explain abduction in the following manner:

> *It implies that a (often surprising) case is interpreted with some hypothetically transcending pattern which, if it were correct, would explain the case in question. The interpretation should then be reinforced by new observations (new cases). The method thus becomes some kind of combination between the two formerly referred to as inductive and deductive, but induces new elements as well (op.cit.: 42, my translation).*

Gary Shank (1993:4) describes abduction this way: "Abduction allows us to reason from the experience at hand, so as to understand that experience not as a unique phenomenon, but as a meaningful case of some hypothetical rule or principle", and, "Abduction is the basic logic reasoning to a hypothetical meaning. Therefore, any discipline that has the issue of meaning as one of its central concerns will also be concerned with abductive reasoning". Chong Ho Yu (1994:8), building on the semiotics of C.S. Peirce, sees abduction as "a type of critical thinking", used "to look for a pattern in a phenomenon and suggest a hypothesis".

To illustrate, an example from medicine may be used. When diagnosing a particular case, a doctor uses the existing symptoms by consulting cases that may present similar symptoms, makes an interpretation and establishes a comprehension of the current case in the form of a diagnosis of a disease, which later may be supported by findings from subsequent cases. Or, to use a model from Yu (op.cit.:8):

> The surprising phenomenon, X, is observed
> Among hypotheses A, B, and C, A is capable of explaining X
> Hence, there is reason to pursue A

Symptoms are examined for theoretically distinct marks. What we see is a dialectic process where empirical and theoretical elements are interpreted, one in the light of the other. It is a reciprocal process with more aspects to it than the rather one-dimensional approaches of

induction and deduction, and it is more sensitive to serendipity and inspiration than its more mechanical counterparts.

A formalized representation of the three models can make it easier to see how the use of abduction can apply to the present study:

Table 4.2 Formalized representation of deduction, induction, and abduction[102]

Deduction	Induction	Abduction
if a then b a thus b	P(a), P(b)….P(x) thus: for all x (phenomena) P(x) applies	b if a then b thus a
where a is the rule or principle and b is the case explained or predicted by a	where a, b, … x has the property 'P'	where b is the observational point of departure and a is the underlying pattern

In the case of abduction, the procedure should be applied to more cases so as to increase the richness of the comprehension and account for variation within the domain.

Abduction makes use of deductive as well as inductive components. How the three compare can be illustrated by looking at how they relate to theory (deep structures), patterns (surface structures) and empirical observations.

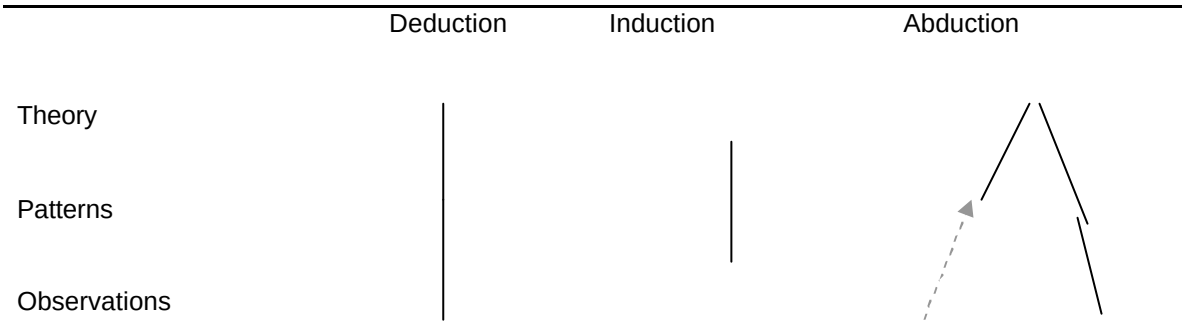

Figure 4.1 How deduction, induction, and abduction relate to theory, patterns and observations.[103] The broken, gray line suggests that the abductive process starts at an aggregated level where empirical observations form a pattern. Hence, there is an element of iteration present.

Yu makes the following observation:

> *For Peirce abduction is the firstness (existence, actuality); deduction, the secondness (possibility, potentiality); and induction, the thirdness (generality, continuity). Abduction plays the role of generating new ideas or hypotheses; deduction functions as evaluating the hypotheses; and induction is justifying of the hypothesis with empirical data (…) (Yu, 1994:8).*

[102] This table builds on an account in Alvesson and Sköldberg (who again refer to Charniak and McDermott for such a formalization.)

[103] The figure is a close approximation of the one found in Alvesson and Sköldberg (op.cit.:45), but with translated categories. In the original, the following Swedish concepts apply: Teori (Djupstruktur), Empiriska regelbundenheter (Ytstruktur), Empiri.

The present study seeks to apply such an abductive approach to data and in particular data from classroom observation. Abduction is felt to invite a conceptual understanding of a phenomenon while opening up for induction to add quantification to argument. It is not a case of determining whether a set of data falls into a particular, pre-determined pattern, but a venture into the interplay of diverse types of information by juxtaposing and combining data. This is seen as facilitating a coherent reading of data, although the process may come across as somewhat 'messy' as it toggles between empirical data to illustrate a phenomenon and a theoretical position that may qualify certain data. In the classroom episodes that provide the data in Chapter 6 abduction entails describing an observed and typical phenomenon before interpreting it from a sociocultural position. This is done in proximity to the phenomenon analyzed (e.g. teacher as designer, cf Chapter 6.5.1 and teacher expertise, cf Chapter 6.10). Where patterns are observed in the data from the statistical analysis of the survey (cf Chapter 5), these might also form a point of departure for an abductive line of inquiry.

This once more brings the issue of the role of the researcher into the study. Gary Shank, writing about the abductive researcher working on the inside of virtual communities, observes:

> *The abductive researcher is less like an experimenter and more like a detective (…) In fact, the abductive researcher is more of a hunter-gatherer. He/she learns to gather information in bricolage fashion. These unique and interdisciplinary craftings of ideas and facts allow the researcher to work outside of strict theoretical boundaries, and to turn to the world of experience directly for guidance (Shank, 1993).*

Such a role is very much compatible with the one outlined in Chapter 4.3; the abductive enquirer goes beyond the world of experience and seeks to apply a conceptual framework to the empirical world in order to rise above 'common sense interpretations' and 'naïve empiricism'.

4.5.7. Conclusion

In the course of Chapters 4.4 and 4.5 the research design has been established together with metaphors intended to capture essential aspects of the phenomenon researched and the abductive procedure of doing so. In order to gain insight into the many aspects of the research questions, the chapter has argued for a mixed model approach and that this approach is compatible with the theoretical framework discussed in Chapter 2. Within a predominantly qualitative design, qualitative as well as quantitative methods have been suggested in a sequence of two main phases, a survey and an ethnographic study, each with three stages: inquiry, data collection/operations, and analysis/inference. In order to rise above inductive accumulation while at the same time trying to grasp patterns in the deep structure of the phenomenon, an abductive approach is chosen. Within this approach, metaphors of *bricolage* and *prism* are used to denote the multifaceted nature of the phenomenon while the mixed model, abduction and a sociocultural perspective are used to capture distinct features of the phenomenon and avoid relativism.

This design reflects a dilemma in the present study. The field is complex, compound and, consequently, requires a broad approach. Conversation analysis or ethnomethodology, might unveil more detail, e.g. on turn-taking and formation of teachers' concepts. On the other hand, a more exhaustive survey of teachers' beliefs might unveil additional widespread convictions and doubts. The present study takes a middle stance. Teachers encountering ICTs do this from two positions. On the one hand, they carry a heritage of professional knowledge, management expertise, and subject authority that influence their relations to ICTs. On the other hand, with

ICTs teachers also become learners of new tools and (therefore) new practices. Hopefully, the mixed model design is conducive to capturing this double effort and thus serves to increase our understanding of what it means to be a teacher in an ICT-rich environment.

Figure 4.2 is an illustration of the research design showing the present researcher's journey (arrowed box on the left) into the field (rectangle with rounded corners) with its phases of mixed model research and the abductive approach framed in a sociocultural perspective. Scales of time involved in the research design are discussed in Chapter 6.2.

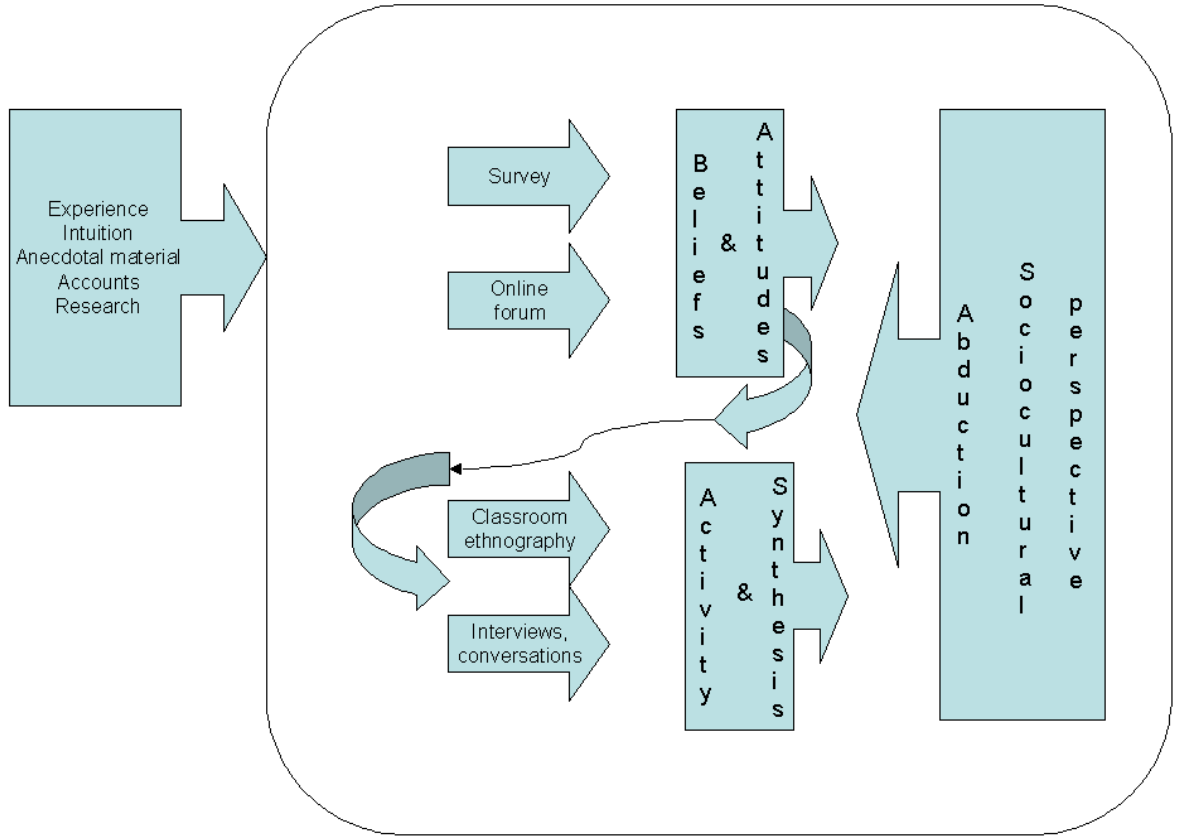

Figure 4.2 Research design of the present study. It is a dynamic and evolving process in accordance with an abductive approach. Also, note that the research questions are not explicitly stated at the 'entrance', but would rather be penetrating the whole research process within the 'rounded' rectangle. The link from the survey and online forum (Phase One) to the classroom ethnography and interviews (Phase Two) is not causal, only suggesting a connection.

The next sub-chapter will deal with the various types of data in more detail, the procedures of data collection, followed by the final sub-chapter with a discussion of the unit of analysis employed.

4.6. Types of Data

4.6.1. Introduction

The data for this study have been collected and processed over a period from September 2000 and until September 2002. During this period, two primary sources (participants in the in-service course *The Tower* as well as teachers and learners in two classrooms) were tapped and several methods used for this purpose. An overview with timeline, sources and methods is

given in Table 4.1 in Chapter 4.5.4. The types of data and their sources are found in Table 4.3 below.

Table 4.3 Types of data in the present study

Data from in-service course, The Tower	Data from field work
Data in the form of survey with a section of forced choice questions	Data from classroom observation, field notes and taped sessions
Data in the form of survey with a section of open-ended questions	Data from taped semi-structured interviews and informal talks with teachers and learners
Data in the form of postings in an online discussion group	

A note on the ethics involved is necessary. All names (teachers, learners, schools) have been changed and anonymized. The survey was approved by the Norwegian Data Inspectorate[104] regarding protection of privacy, and recipients of the questionnaire were made aware of this fact (cf Appendix 1). The editor of *The Tower* along with the county coordinators also gave their informed consent. As for postings in *The Tower's* online discussion list, they became relevant for the present study after most of the participants had completed the course (or dropped out). Hence, participants have not explicitly approved of postings being used. However, the fact that the list was password protected and since then has been archived and is no longer is part of *The Tower* website, anonymity should be sufficiently preserved. The three teachers, who take part in the classroom interactions analyzed, have given permission to use the material yielded by the sessions and conversations taped.

These data together with the techniques for obtaining them will be discussed more in detail in the course of the present chapter. Under no circumstance are data from different situations or different types of research *compared* in order to isolate or study a particular variable. The present study argues that all quantitative data carry qualitative judgments and all qualitative data can to some extent be represented and manipulated numerically. In the survey of participants taking part in *The Tower* this is illustrated by the way the questionnaire seeks to capture beliefs, attitudes, and opinions; "The purpose of a survey is generally to obtain a snapshot of conditions, attitudes and/or events at a single point in time" (Nunan, 1992:140). Despite the surface appearance of an instrument measuring quantitative, 'hard', data this is very much an interpretation of what the researcher found relevant to examine as well as the participants' interpretation of the questions in the questionnaire. Hence, this study adopts the view of Alvesson and Sköldberg (1994:357); that empirical material is to be treated as argument in a debate, and that "Empirical data generated by surveys can possibly be regarded as weak arguments" while participatory observation over time, guided by reflection, can give more weight to arguments used to interpret social realities".

It is also noteworthy that many teachers who completed the questionnaire also added comments in the margin, making use of the pre-designed form to articulate issues felt to be important to them and to elaborate a point, i.e. to transcend the constraints of the format. The questionnaire is in many ways a particular genre for collecting data of a certain kind, and the responses can in some cases be seen as attempts at stretching the genre to accommodate for

[104] The Inspectorate is found at the following URL: < http://www.datatilsynet.no/>, in Norwegian and English.

individual reflection. The many cases of additional comment testify to the questionnaire's character of a tool to think with.

Just like quantitative data can be viewed qualitatively, qualitative data can be divided into units and categories to be numbered. While being aware of data reduction and loss of detail, the present study claims to increase its validity by making some calculations to look for patterns and connections. This, in turn, is intended to sensitize the analyses of classroom interactions.

4.6.2. Data from *The Tower* survey: forced choice questions

The Tower website contained lists of counties with participating schools and names of 423 teachers who signed up for the course (signing up means being able to register and open an electronic folder on the website). In order to operationalize the research issues and obtain data relevant for the research questions (cf. Chapter 1.2), a questionnaire was designed (cf Appendix 1). During September 2000 a first-draft version of the questionnaire was designed in order to map the rate of completion of the course and participating teachers' ideas regarding ICTs in EFL. A pilot version of the questionnaire was first tried out on a handful of teachers who filled it in with the researcher present. This was done in order to spot ambiguities and ill-formed questions, monitor uncertainty and hesitation, and eventually to design a version that served the research questions better than the pilot version. The final version differs from the one used in the pilot test in three respects:

- The original version had two main sections on 'advantages' and 'disadvantages' of ICT in EFL. They were removed, and some of the options were used in questions on roles and effects of ICT in EFL. The reason was to avoid dichotomous thinking and polarization and to obtain a more consistent view of the relations between technology and the subject in question
- The amount of technical jargon and research terminology was reduced and replaced by everyday terms where possible without losing too much precision
- Some reply options were removed as they overlapped with others or did not yield new information

The questionnaire consists of 19 forced-choice questions and 7 open-ended questions, intended to tap into a collective level of beliefs and attitudes. A codebook with values for each entry was written for the final version so as to make the responses analyzable in the *Statistical Package for Social Sciences software* (SPSS).

Sampling

The sampling procedure used for participants in *The Tower* is *purposive* in nature. According to Cohen and Manion (1994:89), "In purposive sampling, researchers handpick the cases to be included in the sample on the basis of their judgment of their typicality. In this way, they build up a sample that is satisfactory to their specific needs". According to Kumar,

> *The primary consideration in purposive sampling is the judgment of the researcher as to who can provide the best information to achieve the objectives of the study. The researcher only goes to those people who in her/his opinion are likely to have the required information and be willing to share it.*
>
> *This type of sampling is extremely useful when you want to construct a historical reality, describe a phenomenon or develop something about which only a little is known (Kumar, 1996:162).*

To the present researcher, Kumar's emphasis on the information potential of the informants and the lack of knowledge in general about teachers' appropriation of ICTs make purposive sampling suitable for the research objectives. In the present study, the sample targeted for the current purpose consists of teachers who completed *The Tower* course (although those who did not are included when the focus is on participation patterns).

The filled in questionnaire was returned by two groups of teachers: On the one hand those who completed the course (referred to as Group A), on the other by teachers who did not complete (referred to as Group B). One concern regarding purposive sampling is self-selecting bias: "Those who return their questionnaire may have attitudes, attributes or motivations that are different from those who do not" (Kumar, 1996:114). This is especially important when looking at teachers who did not complete *The Tower* course (Group B). Their reasons for returning the questionnaire despite their not completing the course may be many and compound. Hence, one has to consider the possibility of a biased sample (cf Chapter 5.10 for representativity of *The Tower* sample).

Except for questions related to gender, geographical location, completion of the course, and working alone/collaboratively, the questionnaire presented respondents with questions to be answered along ordinal scales. Questions 5, 7, 9, 12, 13, 14, and 15 were designed to be answered by way of respondents *ranking, on a numerical scale, alternative statements by way of agreement*. These alternatives are in the form of four most important reasons for a certain belief, attitude or experience, giving the value 1 to the principal choice, 2 for the second choice etc. Unmarked alternatives are given the value 5. The objective is to cover several aspects of an issue while at the same time measuring the intensity of the attitude in order to reduce "the risk of an expression of opinion on only one or two aspects of that situation or issue" (Kumar, 1996:128).

Questions 11, 16,17, and 18, on the other hand, were designed as *alternatives on a four-point, two-directional, Likert-type categorical scale*, where participants chose to circle one of four alternative degrees of agreement or disagreement they felt corresponded to the accompanying statement. The replies were assigned the value of 1 for '*decisive'* (question 16) or '*fully agree*' (questions 11, 18) to 4 for '*not important'* (question 16) and '*fully disagree'* (questions 11, 18). The numerical and categorical scales do not measure attitudes and beliefs *per se* but can place them in a relative position to one another, thus telling us which ones are more salient than others.

Statistical techniques[105]

In order to analyze data produced by the forced-choice questions, a variety of statistical techniques was used.

First, *frequency counts*, *cumulative counts*, and *estimation of means* were used to establish a profile of the sample (cf Table 5.1 in Chapter 5.4.2). To find out why participants signed up for the course (question 5), answers were analyzed by finding the mean value closest to 1 (being the primary choice) and with standard deviation, SD (Table 5.2 in Chapter 5.4.2). A value between e.g. 2,5 – 2,0 would indicate that this alternative receives a high score while 5,0 would indicate no score at all. The standard deviation is a measure of dispersion, indicating the average by which the separate means (e.g. for five alternatives) deviate from

[105] Only the technicalities involved are described in this section. For a presentation of results and comments, see Chapter 5.

the mean of all these alternatives. The greater the dispersion, the higher the value stated as the SD. Thus a low SD would signal more agreement on a certain value than a high SD.

Next, a cross tabulation study was performed in order to find whether there was any correlation between completion of the course on the one hand, and gender, age, experience, and whether teachers worked alone or collaboratively on the other hand (cf Table 5.3 in Chapter 5.4.3). Completion of the course is the dichotomous (yes/no), dependent variable while the gender, age, and working style are independent variables that might explain variation in the dependent variable. Regarding age, three categories were formed using frequencies and cumulative percentages, each representing one third of the respondents; low: up to and including 47, middle: 48-53, high: 54 and above. This means that one third of the sample falls within the rather narrow 48-53-age range.

By way of multiple logistic regression, *Odds Ratios* (OR) with a 95% confidence interval were calculated to indicate possible significant relationships between the dependent variable and the independent variables. Logistic regression is a useful method for analyzing the relationship between one dependent dichotomous variable (in this case the completion or incompletion of the course) and one or more independent variables (e.g. age, experience…). The method is often used in multivariate analysis to determine significant correlations while controlling for covariates. Thus, the technique can be used when some variables may have more impact than others. The differences between probable and not so probable impact are described here as Odds Ratios. There is a 95% confidence interval for the odds ratio meaning that the probability is valid for 95 out of 100 cases. The default odds ratio value is set at 1,00. An Odds Ratio greater than 1,00 implies that, compared with the reference category, there are higher odds that the category concerned will exhibit the property under consideration, the issue of completing the course. Similarly, an Odds ratio below 1,00 means that the odds are lower. In Table 5.3, the column marked ‘crude’ refers to the individual bivariate relations while the column marked ‘adjusted’ refers to the multivariate relations when controlled for co-variation of all variables in the model.

In order to find out reasons given by Group A for completing the course and by Group B for not completing the course, answers to questions 7 and 9 were analyzed by computing the means with standard deviation for the alternatives chosen. Results are presented in Table 5.4 and 5.5 in Chapter 5.4.3. The same procedures were applied to eliciting views on ICTs in EFL in answers to questions 12, 13, 14, and 15. The results are presented in Tables 5.7 – 5.11 in Chapter 5.5.1. As for answers to questions 11, 16, 17, and 18, in the form of categorical Likert-type scales, they are presented in Tables 5.6 (cf Chapter 5.5.1), 5.12, and 5.13 together with Figure 5.3 (cf Chapter 5.5.2) and with the most frequent choice represented by a percentage. The same goes for answers to question 19, presented in Table 5.8 in Chapter 5.5.1.

Presentation. Table 5.2 (cf Chapter 5.4.3) shows a table with standard deviation and gender values. When gender differences and associated standard deviations are found to be significant, the tables will include these values. However, in the present study, this is rarely found to be the case. Consequently, columns for gender are not included in most tables to avoid information glut. However, such issues might trigger comment in the accompanying text.

4.6.3. Data from *The Tower* survey: open-ended questions

The second section of the questionnaire was designed with seven open-ended questions (cf Appendix 1, questions 20 – 26) in order to capture more of the participants' experiences and beliefs, their horizon, than could be done in the forced-option section with its *a priori* established alternatives. Since a pre-designed response pattern was not developed for this section, participants could bring forth attitudes and beliefs that were either particularly strong or that had not been afforded in the forced-choice section.

Questions in this second section addressed important and unexpected insights, possible changes and advantages involved in going from a 'traditional' to an ICT-rich environment, beliefs concerning pre- and in-service education pertinent to teachers of English working in such environments. There was also an opportunity for additional comments.

This section of the questionnaire was not analyzed using SPSS. Rather, answers were grouped according to principles for coding in Grounded Theory (GT) (Glaser & Strauss, 1967; Strauss & Corbin, 1998). In brief, GT makes use of *Open coding* (identifying concepts and their properties and dimensions)[106], followed by *Axial coding* (relating categories to their subcategories), and *Selective coding* (to integrate and refine theory). These procedures lessen risks of lumping random observations together in aggregated categories of similarities and differences. According to Miles and Huberman:

> *(…) it [Grounded Theory] has a lot going for it. Data get well molded to the codes that represent them, and we get more of a code-in-use flavor than the generic-code-for-many-uses generated by a prefabricated start list. The analyst is more open-minded and more context-sensitive, although, here, too, the ultimate objective is to match the observations to a theory or set of constructs (Miles & Huberman, 1994:58).*

The use of techniques established by Grounded Theory tradition calls for a brief discussion of whether GT as a distinct, inductively oriented theoretical framework cannot be separated from its methods, or whether elements of GT can be used within other theoretical perspectives. First, it is important to note that Glaser and Strauss never claimed a 'purist' view of inductivism and theory-generation from 'value-free' empirical observations: "Of course, the researcher does not approach reality as a *tabula rasa*. He must have a perspective that will help him see relevant data and abstract significant categories from his scrutiny of the data" (Glaser & Strauss, 1967:3). Second, it is important to note that GT is "concerned with understanding action from the perspective of the human agent" (Haig, 1995:1).

Brian D. Haig discusses GT as scientific method in light of 30 years development of the approach:

> *It [this paper] takes the view that grounded theory is best regarded as a general theory of scientific method concerned with the detection and explanation of social phenomena. To this end, grounded theory is reconstructed as a problem-oriented endeavor in which theories are abductively generated from robust data patterns, elaborated through the construction of plausible models, and justified in terms of their explanatory coherence (Haig, 1995:1).*

[106] In the words of Strauss and Corbin (1998:101), concepts are defined as "The building blocks of theory", Properties as "Characteristics of a category, the delineation of which defines and gives it meaning", and Dimensions as "The range along which general properties of a category vary, giving specification to a category and variation to the theory".

Haig makes an important distinction between data and phenomena. According to Haig, theories can explain phenomena, not data, and GT should as a consequence be grounded in phenomena. The reason is that phenomena are relatively stable, if opaque, items including *states, events, and processes*. Data, however, are accessible and observable but particular to the investigative context in question. Haig draws the conclusion that while GT should be commended for its principled methods, theory cannot be generated from data, data can only serve as evidence for the phenomenon under investigation: "Generally speaking, statistical methods are of direct help in the detection of phenomena, but not in the construction of explanatory theories" (op.cit.:4). This distinction is sought applied to the survey taking up Chapter 5. The descriptive statistics employed is not used to generate theory but to gain insights in phenomena that emerge from classroom practices (and, to some extent in the open-ended section of the questionnaire and the online discussion forum).

The implication for the present study is that GT is applied primarily in its methodological mode, especially when analyzing the open-ended section of the questionnaire but also when comparing data from different levels in the study. One example is that the category 'loss of control' is found to be salient across levels; at a collective level represented by *The Tower* sample (cf Chapter 5.6) as well as at an individual level represented by the individual teacher practicing in ICT-intense settings (cf Chapters 6.9.3 and 6.9.4).

4.6.4. Data from *The Tower* forum: participatory genre and multilogue

Participants in *The Tower* had the opportunity to engage in an online discussion forum, whether they completed the course or not. Messages and exchanges from January 6, 1999 to June 13, 2000 are preserved and represent an unstructured body of data that is closer to the experience of the participants and their interaction with technology than a questionnaire could produce: With the discussion forum, they are a) actually making use of ICTs while contributing, and b) there is no researcher-initiated instrument inserted between their views and the data output in the form of their contributions to the forum. This gives the data from the discussion forum an immediacy that escapes the survey.

Also in contrast to the survey, there is no way to distinguish Group A (completed the course) from Group B (did not complete), meaning that data collected from this source cannot be directly compared with data from the survey. However, the online discussion list, with its more than 220 participants[107] and more than 600 postings, makes it possible to see whether such a forum reflects or substantiates salient issues found in the survey and/or classroom interaction, or whether it brings forth different issues. The interaction in the discussion forum is to some extent analyzed in terms of frequency counts, but mostly through the use of discourse analysis. As discourse analysis is the main method used in the ethnographic classroom research, it will be discussed separately in Chapter 4.6.6 below and will not be pursued in this sub-chapter.

However, it should be mentioned that discourse analysis in online environments needs to take into account what distinguishes this type of social interaction from face-to-face variants. Collecting material generated by computer-mediated communication is different from other

[107] The use of participant refers to 'active participant' in the sense that it only counts participants who at one time posted a message. There is no way to establish the number of teachers who passively kept track of the discussions, known as 'lurking'.

ways of obtaining data[108]. In this case, a print-out of all 600+ topics stated in the subject line of messages was made in order to get an overview of participants' interests and concerns. Data on the number of postings and the number of teachers who took part were also gathered in order to get an overview of the online activity. Next, postings were grouped according to salient themes in order to find what was on participants' minds during the course and what kind of information and views that were exchanged. An analysis of the discourse architecture, in the form of a *multilogue* (cf Chapter 5.7.1) was carried out to examine the type and frequency of postings. The findings are presented in Table 5.15 in Chapter 5.7.2.

Finally, instead of making a random selection among postings, certain threads and themes were sampled purposefully with a view to capturing complete exchanges on salient topics, e.g. reticent learners, literature suited for a particular level, and teachers' hesitancy towards technologies. Through an analysis of threading it was also possible to analyze conventions and regularities including coherence, dissolution, threading, disorder etc.

4.6.5. Data from the field: classroom interaction

Classrooms are complex ecologies; rich in their affordances, sometimes transparent, sometimes opaque, always suspended between transitoriness and a certain permanence in activities. These activities are enacted on several levels; between the individual learner and the teacher, between dyads/small groups and the teacher, between the whole class and the teacher, but also reciprocally between learners as peers and between learners and teachers and technology. The permutations are indeed many. It is within this ecology that the phenomenon studied materializes: teachers practicing in ICT-rich settings.

The data representing this richness are in the form of field notes, audiotaped sessions[109], and conversations/interviews with teachers and learners.

Field notes were usually written in order to capture what could not be documented in sound such as the atmosphere, ambiance and mood during the session. Further, field notes sought to capture looks, movements, body language, soundless activities and visuals in the form of written messages on the blackboard, in the form of posters and notes on the walls etc. In addition, field notes were used to describe interaction between learner(s) and computers. On some occasions, a line or a phrase spoken out of reach of the audiotape equipment was written down. These field notes proved to be extremely useful in order to recreate the spirit in a class or understand a particular chain of events.

Field notes also proved to be a rich source for later reflection. As Miles and Huberman (1994:67) point out, the technique of taking down reflective remarks alongside raw field notes "improves the field notes considerably". This parallel recording of events and researcher's reactions to them was felt to better clarify the meaning of what was going on and sensitize the researcher towards the many aspects involved. In addition to the volume by Miles and Huberman, M.J. Wallace's book *Action Research for Language Teachers* (1998) provided most of the guidance for creating field notes, in particular his focus on *critical incidents* (op.cit.:64), key incidents which were felt to carry special significance when they occurred.

[108] Simeon J. Yates (2001) has a detailed account of the use of CMC material in corpus linguistics and sociolinguistics.

[109] A 'session' is here defined as a 45-minute sequence, the most common unit for a subject taught in the Norwegian school system.

Audiotaped sessions. Approximately 30 sessions from two schools were audiotaped. This was done by using a 'double recording' approach: First, the teacher was equipped with a Sony MZ-R70 MiniDisc player/recorder and a tiny microphone. This setup was able to record all conversation between teacher and learner(s) within a distance of ca. three meters at normal speech volume plus calls or any other type of higher volume sound from across the classroom. Second, an HP Jornada 540 handheld PC was used to capture short sequences of peer interaction between learners and impromptu questions, exchanges and interviews when an interesting situation emerged. These takes were usually not more than 1-4 minutes long. While the first set-up recorded everything involving the teacher, this second type of audiotaping provided data from 'behind the scenes' in the classroom; subtle exchanges that proved to be crucial in learners' strategies for negotiating tasks or constructing knowledge. They went mostly unnoticed by the teacher (this became clear during informal talks immediately after sessions), but were captured by the researcher who was able to view the dynamics of the class from a more distanced position or look-out post. Together, these two recording techniques were able to capture some of the 'layers' of learning processes (cf Figure 6.1 in Chapter 6.2) that went on within the information ecology of the classroom. All audiotaped sessions were transcribed, but only certain episodes in the rich detail needed for discourse analysis[110]. For a more detailed description of different types of data from the two schools observed, see Chapter 6.1.

Audiotaped interludes. Another type of audiotaped data that proved to be informative was what happened immediately before or after sessions. The tape was kept running so that brief exchanges were captured during breaks, e.g. with teacher colleagues, learners addressing the teacher outside class, and the teachers' immediate reactions after a session was over. The latter type was particularly interesting as it captured the teacher articulating her or his 'gut feeling' about the sessions. With no prompts from the researcher and no situation similar to even unstructured interviews, these sequences seemed to be a welcome opportunity for teachers to articulate their own thoughts and feelings on what had happened. They serve as meta-comments to teachers' own work.

Audiotaped interviews. Semi-structured interviews were used on a handful of occasions, but play a very modest part in the overall research design. According to Kvale (1996:124), the purpose of a qualitative research interview is "obtaining qualitative descriptions of the life world of the subject with respect to interpretation of meaning". Within this frame, the semistructured interview is characterized by a sequence of certain topics to be covered and suggested questions, but there is an overall openness and flexibility to the interview situation. As the primary data in the present study stems from survey, online forum and classroom observations the data from these interviews were partly used as a means to obtain facts pertaining to the teacher's institution, partly to discuss issues that surfaced during the classroom sessions.

4.6.6. Data from discourse analysis

Discourse analysis (DA) is a major type of research method in qualitative analysis in general. Data obtained from *The Tower*'s online discussion forum and from taped sessions and conversations/interviews form the core of the data analyzed this way, but discourse perspectives have also proved useful when analyzing some of the more verbose answers to the open-ended section in the questionnaire. In addition comes a number of policy papers, e.g. curricula, national plans for educational implementation of ICTs, and exam papers.

[110] For a note on transcription, see Appendix 2.

In its broadest sense, "discourse analysis is the close study of language in action" (Taylor, 2001b:5), where "the concern is with *talk and texts as parts of social practices*" (Potter, 1996:105, emphasis in original), and "with the study of the relationship between language and the contexts in which it is used" (McCarthy, 1991:5). The difference between the latter two concerns is that the first builds on a psychological and sociological tradition (Potter) while the second builds on one of (socio)linguistics (McCarthy). This illustrates the fact that DA is a vast field of research covering linguistic structures, social criticism, literary studies, social psychology, and education to name but a few. Alvesson and Sköldberg simply state that "A discourse is a social text" (1994:281).

A broad presentation of DA is not relevant to the present study, but it is necessary to establish an understanding of which approach the present study takes to DA and what kind of research DA has been used for.

First, since social interaction is at the heart of this study, patterns of language use and linguistically related phenomena are of secondary interest. Rather, people's contributions to interaction and the way these materialize in sequences and episodes (cf Chapters 4.7.2 and 6.2) that include use of technological artifacts constitute the analytical object of DA in the present study. Furthermore, the social and cultural situatedness of such interactions are included, since they represent affordances and constraints that influence interactions. Ultimately, accounting for the larger picture represented by aspects of society – educational policies, ethnicity, gender etc could also be integrated in DA, particularly studies of power and resistance. However, this aspect has only been brought up occasionally so as not to experience a 'crowded focus'. The main interest is in how teachers (interacting with learners and artifacts) through activities assign a certain perspective to their practices. This perspective unfolds in diverse settings from in-service training to classroom teaching, online and in co-located settings. This means that DA in the present study is used for questions like the following: Under what circumstances do these episodes unfold? Under what circumstances do we see transformed practices? Which roles do teachers, learners, and artifacts occupy in an information ecology? How do transformative processes manifest themselves?

In order to approach such questions, the present study has found it useful to adopt discursive concepts developed by Teun A. van Dijk (1997). To van Dijk, "discourse should be studied not only as form, meaning and mental process, but also as complex structures and hierarchies of interaction and social practice and their functions in context, society and culture" (op.cit.:6). This approach to discourse links it to a sociocultural perspective on human conduct since it defines text and talk as situated. It does so by describing discourse through four main constructs. The following is a condensed presentation of these four constructs:

1. **Action**. Discourse is seen as intentional, controlled human activity that manifests itself through social activity. This activity carries a certain perspective and has implications and consequences. A teacher's design and orchestration of it is one type of discursive action (cf. e.g. Chapter 6.9.3), another is learners' use of online environments where their personal lifeworlds bring strong elements of out-of-school discourses into a school setting (cf. e.g. Chapters 6.4.5 and 6.6).
2. **Context**. To van Dijk, context is not only settings and local or global dimensions: "Human participants seem to be crucial elements of contexts, and so are some of their action roles, such as being speakers and recipients of verbal acts" (op.cit.:11). This means that people adapt what they articulate to roles and identities they hold as well as

to those held by others. Discourse will vary according to positions and relations. This is exemplified in classroom discourse as seen in e.g. Chapter 6.4.

3. **Power,** defined as social power, power exercised in relations between groups of people and institutions. In the present study, power in the form of educational policies expressed in curricula and plans are particularly relevant. The same is power as it emerges in control aspects of classroom life, how teachers and learners position themselves through controlling discourse contexts and structures. Both aspects mentioned are discussed and exemplified in e.g. Chapters 3.13, 6.4, and 6.7.
4. **Ideology,** like power, establishes links between individuals, groups and society. Ideologies serve to coordinate individuals' practices so that they generally act in similar ways in similar situations. Hence, social identities emerge: "groups think through their members. Thus ideologies of groups organize domain-related group beliefs, which in turn influence the specific beliefs of their members" (van Dijk, 1997:31). This view is reminiscent of ideas on the social mind as documented by Valsiner and van der Veer (2000), which in the present study is seen as a point of entry to sociocultural perspectives (cf Chapter 2.2.2). Although the ideological dimension is not at the fore of the present study, it is found in views elicited from *The Tower* sample and in policy papers.

These four constructs are complex and, according to van Dijk, in need of further development. Still, what makes them suitable in the present study, apart from their sociocultural inclination, is the multilevel analysis they invite to. They can be used to focus on individual, group, and institutional aspects and the relations between them; they, in fact, are directed at how people move between singular, individual actions and patterns of societal participation. van Dijk concludes that, "it appears necessary to relate the social and the individual, simply because language users speak and understand both as group members and as persons" (op.cit.:35).

Ultimately, data from discourse analysis points towards a unit of analysis that allows for multiple levels. This topic will be treated next.

4.7. Unit of Analysis

4.7.1. Multilevel analysis[111]

As discussed in Chapter 2.3.3 on artifacts, the present study subscribes to the view of humans as tool-oriented beings. This view is used to understand teachers' use of ICTs. However, there are both institutional, collective and individual levels present with corresponding levels of description. The question is to which extent these levels can converge in one common denominator, or whether they should be kept separate. In the latter case, this would mean seeking insight at different levels that might refract different but complementary aspects of the phenomenon studied.

In light of the metaphors used in this study - bricolage, crystal, information ecology – the second alternative is the one chosen. There are different levels of description involved. Some of the data are secondary, giving more of a backdrop to and qualifying the primary data. Table 4.4 (below) gives an overview of the types of data, the levels of analysis, and how data are ranked.

[111] This sub-chapter draws on a talk on multi-level analysis by Sten Ludvigsen at The 5th Nordic Interactive Research School, Oslo, May 26-31 2001.

Table 4.4 Overview of types of data, level of analysis, and status of data

Type of data	Level of analysis	Primary/Secondary
Policy papers, curricula, exam papers	Institutional	secondary
Survey, answers to forced choice questions	Collective, situated and multivoiced attitudes and beliefs analyzed through descriptive statistics	secondary
Survey, answers to open-ended questions	Collective, situated and multivoiced insights analyzed through emergent categories (Grounded Theory)	secondary
Postings in online discussion group	Collective and individual, naturally occurring interactions in a participatory genre; the multilogue, analyzed through Discourse Analysis	secondary
Talks, conversations, interviews	Individual reflections and immediate reactions to practice analyzed through Discourse Analysis	secondary
Classroom observations	Individual and collective activities analyzed through Discourse Analysis	primary

Artifacts produced by learners (written texts, online postings, ICT-enhanced presentations etc.) amount to a type of data that belongs under classroom observations, even though they may not emerge at the same time as the observable activities that produce them. The same goes for artifacts produced by participants in *The Tower* who submitted solutions to tasks, created lesson designs, websites etc. However, these artifacts embody much of the classroom interaction including teachers' beliefs and attitudes and are referred to on several occasions.

4.7.2. Unit of analysis, IRF and IDRF patterns

Analyzing learning and teaching processes where ICTs are integrated is a complex endeavor because the processes themselves are so complex. Consequently, the appropriate unit of analysis has received a lot of attention among researchers. In a paper on the complexity of distributed collaborative learning, Fjuk and Ludvigsen write:

> *We argue that the profound changes in the area of collaborative learning caused by ICT and networked computers can only be understood by extending the unit of analysis from technology and pedagogy themselves to real-life social contexts in which ICT is used (Fjuk & Ludvigsen, 2001).*

The present study argues that such complexity is felt just as pressing when teachers and learners (and teachers as learners!) engage in processes that are partly face-to-face and partly mediated by ICTs. Chapter 6 is intended to examine such 'interface practices' where activities

are located across two communicative modes, co-located and distributed. The issue that arises is to identify a suitable unit of analysis for such complexity.

R. Keith Sawyer in an article on *Unresolved tensions in sociocultural theory* (2002:12) concludes: "This is one of the unifying features of the paradigm: The unit of analysis is situated social practice, rather than the bounded individual as in traditional psychology". On the other hand, Lasse Lipponen (2002:4) concludes that within the sociocultural perspective, "To date, there is no consensus about the unit of analysis, whether it should be individuals, dyads, groups, communities, or (…) collaboratively produced knowledge objects or conceptual artifacts". In the following discussion, Sawyer's unifying feature of situated social practice is defined at group level, but where the group form is in constant flux from to dyads (learner – teacher) to whole classes and sometimes more than one teacher. There is, of course, room for the individual, but as part of a practice that comprises others.

The unit of analysis used in the present study is found within the interaction between teachers, learners and mediating tools. In light of the complexity of this interaction it is of vital importance to work out a relevant unit of analysis where the *demands* placed on teachers can be analyzed as they materialize in classroom interaction. These demands are partly articulated by learners, partly by ICTs, partly by the subject matter, partly by policy makers, and partly by teachers' demands on themselves.

In order to capture processes as described above, a larger unit than e.g. single utterances and turn-taking is needed, but at the same time one that is delimited from larger activity systems such as educational institutions or a community of teachers on a national scale. In the present study the unit of analysis chosen is that of an *episode*. This unit has earlier been used in classroom research, e.g. by Martin Nystrand who has defined the episode in the following way:

> *An episode was defined as a coherent classroom activity centering around a particular objective or purpose. A new episode was marked when the teacher addressed a new objective. Like the start of a new paragraph, each such shift usually was evident in the teacher's initiation of a new topic. Usually episodes consisted of two or more activities. (…) When something like this happened, we divided the episode into* segments*, defined as any coherent part of an episode that differed from other activities of the episode (Nystrand & Gamoran, 1997:35, emphasis in original).*

However, Nystrand's definition arises from learning processes where ICTs are not integrated. Also, it seems to use the teacher's initiation of a new topic as a signal for a new episode to develop, making it a close fit to the *Initiation – Response – Feedback* (IRF) sequence[112] with its linear process and possible inherent teacher authority (although Nystrand does not advocate such practices). In digital and networked learning environments processes can be initiated by teachers, by learners, and by technologies – sometimes planned, sometimes as a result of coincidences and serendipity (Fine & Deegan, 1996; Langager, 2001). Also, not just immediate response may occur but rather some form of discussion, negotiation or problem-solving at different levels; learner – learner, learner – technology, learner – teacher and various combinations of these.

[112] According to Gordon Wells (Wells, 1999:167), this procedure accounts for approx. 70% of interaction in secondary level classrooms.

This type of episode takes on additional features and moves beyond the common Initiation-Response-Feedback (IRF) exchange and into Mercer and Wegerif's Initiation-Discussion-Response-Follow-up structure, IDRF (Mercer & Wegerif, 1999:90). What we see in ICT-rich classrooms are episodes where relations between learners, tutor(s) and technology change, often quickly and because of some sudden and unforeseen twist or stimulus, an element of demand or challenge. In other words, the episode represents different and transformed types of participation (Lave & Wenger, 1991). This also means that the extended IDRF unit takes on more than structural characteristics and becomes a meaning-making tool that affords more negotiation and joint constructions of meaning[113]. Chapters 6.4.2, 6.4.6, and 6.5.2 show how various IRF and IDRF sequences emerge in classrooms where technologies are integrated in designs and activities

The episode as the unit of analysis has the potential of transcending the teaching – learning and teacher – learner dichotomies by making *activity* and social *practice* the analytic point of departure. It does not restrict analysis to singular relations e.g. between learner and technology or learner and teacher. The episode places activity and participation in focus, which means that it captures use and appropriation of learning and teaching resources along with social interaction. It does so by emphasizing relations between learners, teachers and technology and how they constitute an information ecology. Thus, learning, teaching, and artifacts, become mutually constitutive aspects of educational practices.

A suitable unit of analysis risks losing out on two points: it can prove to be too narrow and miss some of the broader features that may prove to be of consequence, like national and local policies, curriculum etc. In this way it becomes reductionist. But it can also be too broad and lose out on some of the detail that is found in single utterances or micro-events. The episode as it is identified in the present study is regarded to be at an intermediate level. It is possible to pursue it in detailed analysis as well as opening it up towards more general patterns that may recur and go beyond these into discourses found in policy papers and curriculum reforms. However, there will always be a question whether the unit needs to be refined or changed as new technologies and new practices develop. This is certainly the case when looking at the practices that develop over time and is distributed over physical, co-located settings (classrooms) as well as virtual extensions (online forums) as in Chapter 6. That is why the chapter early on (cf 6.2) picks up on topics such as time scales and space in relation to the unit of analysis applied to classroom ethnography.

4.8. Conclusion

The present chapter has argued for a mixed model research design that also allows for a multi-level approach.

A *mixed model design* combines quantitative and qualitative approaches (and not necessarily in a state of pure cultivation) to data across all phases of the research process. Such an

[113] Wells sees the IRF pattern (Wells refers to it as 'triadic dialogue') as "a particular variant of exchange structure" (Wells, 1999:173). However, he extends the notion of structural element by interpreting the third F-move as an attempt by the teacher to make the learner connect with other parts of her experience during a session as well as those of others. Consequently, Wells sees the IRF unit as more than a structural element; it is also a meaning-making tool closely connected to a joint construction of meaning in the classroom (op.cit.:206-207). The implication is that IRF sequences may have more socio-cognitive potential than many critics allow for, such sequences are not merely an organizing tool but also a stepping stone for extended communicative practices: Wells sees the third move (F in the IRF) as a point of departure for co-construction of meaning. However, in the present study, the IDRF sequence (and its many possible variations) is seen as a meaning-making tool that affords more opportunities and innovative practices than the IRF sequence.

approach expresses a concern for capturing the richness and complexities of the research object, humans (teachers and learners) interacting with – and through – technologies, and the various 'refractions' from it. Also, a mixed model design has been considered conducive to answer the research questions raised in the present study.

The present study also argues that a *multilevel analysis* is needed. Unlike a mixed method, a multilevel analysis aims to capture the phenomenon studied in diverse contexts. For teachers appropriating and practicing with ICTs, several levels are involved. Firstly, there is the individual level at which the teacher interacts with technologies. Secondly, there is an interactional level at which the teacher interacts with colleagues (as in the case of *The Tower*) and/or with learners. As Chapter 6 shows, this is also the level at which we find extensive learner-to-learner interaction. Thirdly, there is an institutional level at which we find tensions and contradictions that constrain educational change (contradictions may also trigger change) but also affordances that are conducive to change. A sociocultural perspective on human conduct considers individual, collective and institutional levels as interrelated. Therefore, a multilevel approach would seem to be suitable and even required in order to capture the phenomenon under examination.

However, the present study does not give equal weight to the three levels. Focus is on the second, interactional level while the other two are somewhat blurred. This is a conscious choice in order to draw attention to teachers' classroom practices, not an opinion as to what is more 'worthwhile'. For instance, studies that focus on institutional change and blur the two other levels might prove to yield extremely valuable information as to under what conditions change is advanced and sustained.

The mixed model and multilevel approach are seen as reciprocally informative. The former is a method of producing different but complementary types of data, while the latter illustrates how such data must be understood as interdependent levels of a phenomenon.

On a continuum from planned to unplanned data collection, the mixed model design of the present study, as outlined in the previous sections, covers both types except for extremes. While the questionnaire is highly planned, it opens up for the unexpected in the open-ended questions. The discussion forum, on the other hand, provides highly unplanned information but not accidental as it is highly contextual to the phenomenon studied (Tashakkori & Teddlie, 1998:96-97). The aim has been to address the phenomenon across several levels and types of data in a mixed model research design, not to generalize broadly but to go beyond the potential idiosyncrasy of the individual case.

The above outlined approach has led to the unit of analysis in the form of the episode. At the core of the episode, activity is seen as the essential characteristic. Moreover, the episode is seen as being flexible as to time scales as well as levels of analysis. These latter aspects will be pursued when the unit of analysis is operationalized in Chapter 6.2 and several of the consecutive sub-chapters.

In the course of chapters 2, 3, and 4, theoretical perspectives, the compound knowledge domain, and the research design and methods have been accounted for. Now it is time to analyze empirical material in light of these three previous chapters. First, mostly quantitative data from the in-service course *The Tower* will be dealt with in Chapter 5, followed by qualitative data from classroom practices in Chapter 6.

5. *The Tower* survey: a descriptive statistical analysis of teachers' beliefs about ICTs

5.1. Introduction

As noted in the introductory chapter to the present thesis, *The Tower* is the name of an in-service course for Norwegian teachers of EFL in senior high school. Participating teachers work online and offline and they are given tasks and material to study that address issues of teaching EFL in ICT-intense settings. With its integrated approach to a subject discipline and technologies, *The Tower* course is different from the type that offers de-contextualized, instrumental ICT skills like e.g. word processing and use of email.

The overall purpose of the survey (cf description in Chapter 4.6 and Appendix 1 for the questionnaire used) and, thus, the present chapter is to find out how some teachers think about technologies and their professional relationship to ICTs. In other words, the purpose is to examine how teachers *conceptually* appropriate ICTs (cf Chapter 2.3.5). Viewed this way the survey can be seen to capture the socioculturally constructed ideas and beliefs a particular sample of teachers expresses at a particular time: "The purpose of a survey is generally to obtain a snapshot of conditions, attitudes and/or events at a single point in time" (Nunan, 1992:140). In this type of research, there is no explicit activity to observe. However, the responses to the questionnaire used in the survey can be seen as a rhetorical aspect of how respondents think about their profession as it changes under the impact of ICTs. According to Roger Säljö (2000:234, my translation), "In a sociocultural perspective it is evident that human thought develops from attempts to master our natural and social environment. But our knowledge about the world does not exist in objects or events as such but in our discourses about these and the artifacts". The survey from *The Tower* sample can be seen as part of such a discourse, and with a particular view to examine:

- attitudes to and beliefs regarding ICTs in EFL among participants who completed *The Tower* course
- beliefs regarding the roles and identity of teachers working in technology-rich environments, as articulated by participants who completed *The Tower* course

Following are a presentation of the course, a presentation of the data gathered and a discussion of the findings. The presentation of the findings is in three parts; the first section deals with the forced-choice part of the survey, the second section deals with the open-ended questions, and the third part deals with the online discussion forum.

5.2. The Tower environment

5.2.1. Background

The Tower[114] (No: "Språktårnet") is an in-service training (INSET) course for teachers of English in the Norwegian Upper Secondary School system. The course is conducted via the Internet and runs over approximately one year. Participants have to make use of the Internet in order to meet the goals of the course; combining new approaches to learning and teaching with new technology. The course integrates didactics and digital technologies, both networked (email, websites) and stand-alone (software) tools. Through seven modules, teachers are

[114] The Tower is at the time of writing located at the following URL: http://ln.kunnskapsnettet.no/tower/

exposed to new technologies, integrated in approaches such as problem-based learning and learner autonomy. The teachers who sign up for the course have to take on the tasks and assignments that come on top of their regular work as teachers. An 'editor'[115] served as a combined resource person, content and task designer, and manager of the course between 1998 and 2002. When the first course ran in 1999-2000, some schools allotted a small time resource to teachers who signed up, others provided better access to hardware and Internet connections. On the whole, however, teachers took the course alongside their full-time (or part-time) jobs without any form of compensation.

The general rationale of the course can to some extent be found in the 1994 Reform of the Norwegian Upper Secondary School system, where ICT proficiency is among the goals in the English curriculum (cf 'National plans' in Chapter 3.13) but only categorized with "diverse tools such as dictionaries, grammars, reference works, and available information technology" (my translation). However, the first national plan for the introduction of ICTs in Norwegian education (KUF, 1995) calls for more in-service training of teachers, and *The Tower* must be seen as one of the replies to this goal. In the introduction to the course, five items were listed as a framework for the course[116]:

a) Reform 94 and its new curricula in English require new methods of teaching.
b) Information Technology opens new possibilities for information retrieval, communication, and processing of written work
c) Resourceful teachers of foreign languages are scattered without adequate communication
d) The Counties have obligations towards language teachers in the Upper Secondary School regarding in-service training
e) The Counties have limited financial means

The initiative to establish *The Tower* came from four counties, which, after a joint meeting January 22-23 1998, invited the rest of the counties in Norway to participate in the project. In the letter from the editor, the goals of the project were outlined as follows:

a) To give language teachers a tool to gain knowledge about learning and teaching with ICTs
b) To give language teachers a tool to keep updated
   -on the target language
   -on culture/background in the target language areas
c) To give language teachers a forum where they can contribute to a professional discussion by exchanging ideas and thoughts
d) To give language teachers possibilities of forming networks
e) To motivate and enable teachers of English to make use of ICT
f) To give the counties an inexpensive tool to meet their in-service training commitments towards teachers of English
g) To ensure greater equality in the educational opportunities for all pupils in Norway

It was clear from the outset that *The Tower* should serve more languages than English. However, to this date this has not come about (as of 2002). Other subjects have established

[115] The term 'editor' refers to the job as being an editor of online resources. The editor of *The Tower* is a native English speaker and fluent in Norwegian.
[116] Letter from the editor of the Tower dated Jan 15, 1999 (my translation).

separate rooms or areas, like *The Studio* (No: Atelieret, for arts and crafts), *Norway House* (No: Det norske hus, for Norwegian) etc.

5.2.2. Administration

Some parts of the course, mainly the online resources and links sections, remained open to all interested parties while lectures, tasks and a discussion group were reserved for participants from the 13 paying counties.[117] The course ran for approximately one year but it turned out that several participants required 18 months to finish. By September 2000, the 13 original counties had completed the project, while new ones were in the process of starting up or in the middle of working through the course. Although no further organized courses are currently ongoing, the material designed and developed will remain in *The Tower* website, so that teachers can consult these resources and exploit them if and when they find them useful.

The participants who started out in 1999 had to sign up for the course in order to gain entry to the material. An estimate of 40 hours work to complete the course proved to be a rather conservative figure. Everything had to be done in teachers' spare time or during time allotted to them as part of local school arrangements. The administrative responsibilities in *The Tower* were divided between the editor (with some input and contributions from participants and external experts) and 13 county coordinators with EFL and ICT proficiency. These county coordinators should inspire, guide and help participants in their respective county but also keep track of the county participants' work and write reports to the county's educational administration. Tasks also included setting up local websites to serve the participants in the region. For the editor, working with *The Tower* was estimated to fill half a post. For county coordinators 10% of a full post was allocated, although some got slightly more depending on the number of participants in her/his county. As discussed in chapter 4.3, the present researcher worked as a county coordinator for one of counties as from January 1999 until July 2000.

When launched, *The Tower* was part of a larger network, "Kunnskapstorget", which provided technical assistance beyond file transfer and web design. This included setting up a synchronous chat forum, making available personal folders on-line, providing usernames and passwords and the like.

5.2.3. Course design and contents

The Tower course was divided into seven modules, each with a separate topic, placed in the 'Lecture hall'. When teachers signed on, the topics had already been decided on (by the editor) but they were not made available or even developed until later. The idea was that participants should concentrate on one topic at a time and not jump ahead. The whole course content consists of the following seven modules that appeared on the website under the following headings:

Topic 1: Information Retrieval
Topic 2: How to Use Support Programmes
Topic 3: Problem Based Learning
Topic 4: Communication and Cooperation
Topic 5: Pupil Autonomy

[117] Since then, "The Tower" has become part of the national knowledge network, "Kunnskapsnettet" http://www.kunnskapsnettet.no funded by the Department of Education, Research and Church Affairs. This means that teachers in the remaining seven counties now have access to all of the material.

Topic 6: Presentation and Publication
Topic 7: English for Special Purposes

Each of the seven modules is structured in the following manner:

- Practical ICT exercises for beginners
- Practical exercises for more advanced users
- How can we use this in the classroom
- Subjects for discussion

The two latter items involve tasks and assignments to be handed in to the county coordinators. Alternatively, these could be placed in an on-line folder, serving as a portfolio for the participant. In addition to the seven modules, a conferencing section was set up where participants could discuss topics and tasks, ask for or give advice, share resources and information etc.

To pass the course, participants had to produce written contributions to five of the seven topics and take part in the asynchronous on-line discussion forum called the *Meeting room*. No credits were given, only a diploma certifying that the participant had passed the course according to the requirements.

5.2.4. Additional features

Apart from the *Lecture hall* (containing the course modules) and the *Meeting room* (the discussion forum), which are open to participants only, *The Tower* offers additional rooms with the following features (all open to the general public):

- *The Classroom* with examples of good practice, taken from Norway and abroad
- *The Look-out post*, mainly with links to EFL resources
- *The Library* with a selection of articles, official documents, and other material pertinent to the course
- *The Study* with theoretical and methodological issues and also information on international conferences relevant to language learning and teaching, including CALL

With the added features in the form of the *Editor's office*, a *Chat room*, and a *Search facility* the architecture of *The Tower* is complete. With its ambitious goals and scope, its plentiful resources, and (at least at the time of establishment) its innovative approach *The Tower* would seem to demand quite a lot from participants doing the whole course.

The course is grounded in the communicative approach underlying the Norwegian EFL curriculum and the six areas of competence that are defined to form the concept of communicative competence: linguistic, sociolinguistic, discourse, strategic, sociocultural and social competence. In addition, the course explores and exploits the possibilities of ICTs as tools in developing the four skills, listening, reading, writing, speaking. Consequently, the course is partly confirming approved targets and practices, partly presenting innovative and technological perspectives embedded in a pedagogical and didactic framework.

The latter point is important. Most in-service courses in Norway had – at least until the advent of *The Tower* and similar courses – mainly been restricted to hands-on events focusing on hardware and software and the instrumental skills needed to use certain ICTs. *The Tower* represents a departure from these instrumental approaches. The course focused on

pedagogic/didactic issues with new roles for learners and teachers as one of its recurring themes. Under the impact of institutionalized goals on the one hand and the potential for innovation on the other, participants in *The Tower* articulate their ideas, beliefs and approaches to EFL and ICTs. To the present researcher, this situation makes *The Tower* and its participants interesting for research purposes. The tensions, affordances and constraints that are present in such situations influence the way ICTs are appropriated by teachers.

5.3. Research issues

The research questions for the whole study are introduced and explicated in chapter 1.2. The present, quantitative section of the study seeks to examine ideas and beliefs of some teachers of English who have been exposed to and participated in ICT-infused practices over time. Consequently, they are in a process of appropriating ICTs within the constraints and affordances of *The Tower* course as described in Chapter 5.2. The questionnaire serves as a tool for teachers to articulate some dimensions of appropriation (cf Chapter 2.3.5), particularly their conceptual appropriation although other dimensions will be captured as well (cf Chapter 2.3.5). When such appropriation processes are articulated they can serve as a guide to making more informed observations when analyzing individual teachers' practices in technology-rich environments (cf Chapter 6).

In order to tap into the beliefs, attitudes and experience of *The Tower* sample, an exploratory, descriptive research design has been chosen without any type of prediction or a priori hypothesis although the questionnaire will, of course, reflect the present researchers' approach to ICTs as being cultural tools. Three research issues are outlined and specified in terms of supplementary questions since, "In exploratory investigations, the purpose of the study is typically stated in terms of research questions" (Tashakkori & Teddlie, 1998: 53).

The first issue concerns *reasons why some teachers completed the course (Group A) and why some did not (Group B)*. The issue is sought clarified by raising four questions:

- Are there any significant factors in demographics, experience and working conditions between Group A and Group B?
- Do the teachers in Group A and B state different reasons for signing up for the course?
- What are the reasons teachers in Group B give for dropping out of the course?
- What are the reasons teachers in Group A give for completing the course?

Findings are presented in Tables 5.1 – 5.5 below.

The second issue concerns *beliefs about and attitudes to ICTs* (and in particular ICTs in EFL) among those teachers who completed the course (Group A). The guiding research questions for this issue are:

- What do participants say about the relevance of the course?
- What do participants say about the effects the course had on them?
- What do participants say regarding effects of ICTs on EFL?
- What do participants say regarding the role of ICTs in society?
- What do participants say regarding ICT-infused processes the EFL classroom?

Findings are presented in Tables 5.6 – 5.11 below and also in Tables 5.14 – 5.15, which submit findings from the open-ended questions and the discussion forum.

The third issue concerns *beliefs about and attitudes to the roles of teachers who integrate technology in their practices.* The research questions for this issue are:

- What do participants say are important and not important teacher roles in an ICT-rich environment?
- How do participants perceive their identity and value as teachers?
- To what extent do participants feel they work both in physical and virtual learning environments?

Findings are presented in Tables 5.12 – 5.13 below and also in Tables 5.14 – 5.15, which submit findings from the open-ended questions as well as the discussion forum.

These questions are fairly broad in scope and are designed to point forward to the qualitative, ethnographic section of this research project (cf Chapter 6). Data and findings related to *The Tower* sample are also seen as complementary to data from classroom ethnography. They serve to sensitize the researcher towards the practices observed in technology-rich settings. For a detailed description of sampling and statistical methods, see Chapters 4.5 and 4.6.

5.4. Survey: sample of participants

5.4.1. Response

There is no record of how many teachers who turned up at the introductory meetings that promoted *The Tower* in the 13 counties. Also, it is hard to tell how many actually started the course. A number of the 423 participants who registered for the course never established a portfolio, logged on to the website or made it into the first module. There is, in fact, no track of the actual number who might have tried and given up (there were quite a few technical snags in the beginning). A request to the editor of *The Tower* as to how many teachers who started and completed the course resulted in the following estimate:

> *It is hard to tell the exact number of teachers who started. In the beginning (April 1999), 600+ teachers from 13 counties had registered as members of The Tower. 30 dropped out quickly without handing in any assignments. (…) As of today, 174 have received their diplomas.*[118]

On October 8, 2000, the present researcher notified the participants of *The Tower* that a survey was imminent. The notification was issued in the form of a posting in the discussion forum. The final version of the questionnaire was mailed to 423 participants in October 2000 with a covering letter stating that the deadline for return was January 1, 2001. Self-addressed envelopes were included with the questionnaire, but return post was not paid.

By November 15, 2000, the researcher had received filled in questionnaires from 87 teachers who had completed the course and from 91 people who had not completed the course. An online acknowledgement (in the discussion forum) and a reminder triggered follow-up activities from some county coordinators and this resulted in an additional number of returned questionnaires. By the deadline, Jan 1, 2001, the researcher had received 107 questionnaires from teachers who had completed the course and 101 from teachers who had not. The 208 returned questionnaires were coded and entered into the SPSS statistics program (cf Chapter 4.6.2) during early 2001. It is important to note that the teachers who did not return the

[118] Private email correspondence from the editor, dated 31 October 2000. My translation.

questionnaire would still be active and influence the course, e.g. in the online discussion forum, but there is no way to single out this group because the survey was based on anonymous participation.

5.4.2. Participation

The main interest of the quantitative section of the study is with Group A consisting of the 107 teachers who completed the course and returned the questionnaire (61,5% of the 174 teachers who completed the course). As these teachers completed the course, it means they encountered ICTs embedded in their school subject and within a pedagogical framework. In other words, ICTs are not encountered as merely add-ons but as artifacts; refined cultural tools that carry accumulated intellectual and practical knowledge. Therefore, the ideas, beliefs, attitudes, reflections, and experiences of teachers in Group A are important if we are to understand how technology is appropriated by (at least a sample of) teachers. Consequently, this group will receive most of the attention in the following.

The participants who signed up for *The Tower* come from 13 of Norway's 19 counties, which makes for a representative geographical distribution. However, the number of participants who initially signed up varies from one county to another, i.e. from 19 to 112. The number of county participants who returned the survey also varies from 3 (Finnmark, 1,4% of the sample) to 35 (Hordaland, 16,8% of the sample). Other high scores are represented by Vestfold (14,4% of the sample) and Telemark (10,1% of the sample). On the whole, the number agrees with the proportionate population in the county of the participants. However, the capital of Oslo scores comparatively low (27 started out, 12 participants = 5,8% of the sample returned the questionnaires). Still, despite such variations the returned questionnaires are seen as being geographically representative of participants in *The Tower*.

Demographic characteristics of the sample population of teachers are found in Table 5.1 below and in the accompanying comment.

Table 5.1 Characteristics of the sample population (n=208) regarding age and experience. Both Group A (completed course) and Group B (did not complete course) are included.

	Total	Women	Men	Missing
Returned questionnaires	208	120	87	1
Average age of participants	49,8	49,6	50,1	
Average years of practice	20,4	19,3	21,9	
Accumulated years of practice	4184	2262	1908	1

There is a majority of women among the respondents (57,7%)[119]. The youngest participant is a man of 24 (did not complete) while the oldest is a woman of 69 (completed). The majority of the participants is between 45 and 60. The average age of 49,8 years might seem high, but

[119] In most of the subsequent tables, men and women do not form separate categories, as there is rarely any significant difference between responses from the two groups. Where gender differences are found to be of interest, comments are found in the text accompanying the table.

is only slightly higher than the average age of the Norwegian senior high school teacher, which was 47,2 years in the year 2000 with 46% of the teachers being above 50 (according to the Norwegian Teachers' Association). The many years of teaching experience represented by the sample are also noteworthy. Figure 5.1 shows a bar chart of this characteristic.

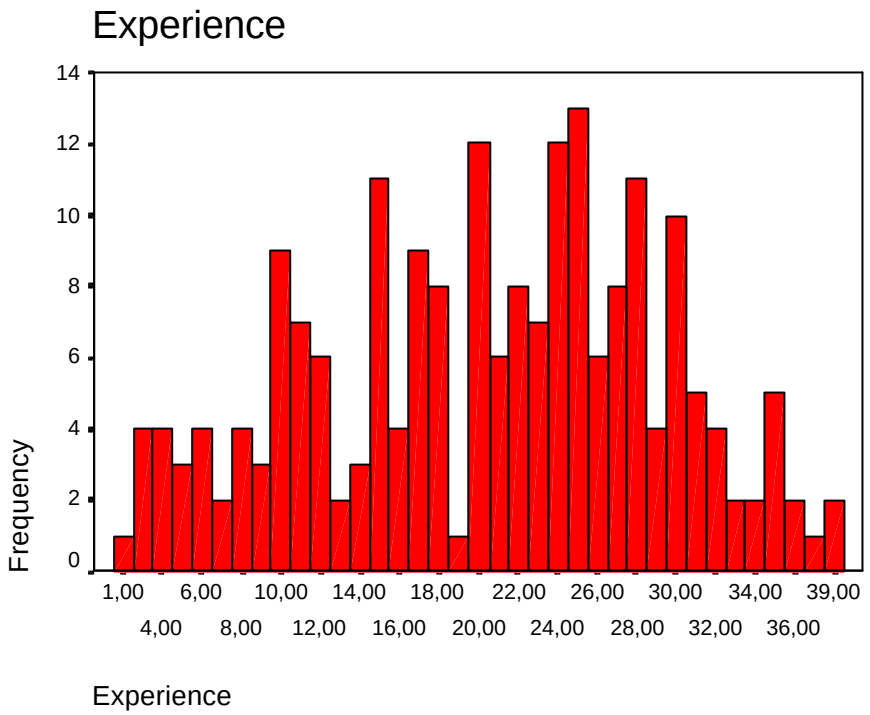

Figure 5.1: Bar chart showing distribution of teaching experience for the sample (n=208). The horizontal axis shows the number of years teaching, the vertical axis shows the distribution in numbers.

Table 5.1 and Figure 5.1 show that despite the wide distribution the experienced teacher is typical of *The Tower* sample. The implication is that the sample with its average of 20,4 years of teaching experience enters *The Tower* course with quite some teaching confidence. However, such confidence may not have been accumulated in the case of ICTs. One way to find out is to ask about reasons why participants signed up for the course.

5.4.3. Signing up, completing, dropping out

In order to find out whether Group A and Group B had different motives for deciding to sign up for the course, participants were asked for their primary reasons, ranking them from 1 to 5 (cf question 5 in Appendix1). Hence, a low *Mean* value represents a highly ranked reason. The standard deviation (SD) indicates the dispersion of the values (ranged 1 to 5) attached to an alternative. A high SD would suggest a greater dispersion while a low SD would suggest a more clustered picture (for a detailed description of statistical techniques, cf Chapter 4.6). The results are printed in Table 5.2 below.

Table 5.2 Participants' principal reasons for signing up for The Tower.
Reasons presented in descending order of means for the whole sample.

I signed up for the course because:	Total (n=208)		Group A (n=107)		Group B (n=101)		Women (n=120)[1]		Men (n=87)[1]	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I wanted to learn about ICT approaches to language learning	2,25	1,48	2,19	1,45	2,32	1,52	2,19	1,43	2,33	1,56
I wanted to learn about new technologies	3,02	1,48	3,12	1,47	2,91	1,48	2,97	1,54	3,07	1,39
I wanted to be part of a network of English teachers	4,12	1,26	4,11	1,31	4,12	1,23	4,17	1,22	4,03	1,33
I was curious	4,15	1,17	4,20	1,18	4,10	1,17	4,18	1,11	4,10	1,26
I was afraid I would not be up to date if I did not participate	4,17	1,34	4,11	1,38	4,24	1,30	4,14	1,38	4,23	1,28
My school administration wanted teachers to take part	4,32	1,25	4,43	1,17	4,21	1,33	4,38	1,18	4,25	1,36
I thought ICT literacy might increase my professional status	4,38	1,13	4,22	1,22	4,55	1,00	4,39	1,13	4,37	1,14
I wanted to increase my qualifications for the future job market	4,62	0,90	4,73	0,75	4,51	1,04	4,55	0,95	4,71	0,83
My teacher colleagues wanted me to take part	4,63	0,98	4,65	0,98	4,62	0,98	4,68	0,94	4,56	1,04
I thought ICT might ease my workload	4,77	0,66	4,72	0,71	4,82	0,61	4,84	0,52	4,67	0,82
Other reasons	4,77	0,84	4,74	0,89	4,81	0,77	4,80	0,75	4,78	0,85

1) For gender, one value is missing making the total 207. This applies to all tables where gender is a variable.

There does not seem to be any marked difference regarding motives for the two groups, A and B. For both groups, only the first two categories in Table 5.2 are highly salient, both reflecting the wish to learn more, and with a clear inclination towards prioritizing aspects of language learning. Learning about ICTs is slightly more important to Group A than to Group B. Reasons reflecting peer pressure and external motivation are ranked consistently low, especially for Group A. The differences are all small. When checked for gender, the results show no significant differences although women attach somewhat more significance to ICT approaches in EFL while men attach slightly more value to be in a network of teachers of

English. These results cannot be used to explain why some completed and some not, but can be used to describe some driving forces behind teachers taking on in-service training where ICTs are involved.

In order to pursue the question of attendance, a multivariate analysis involving several factors was conducted. Participants were asked whether they had completed the course (Group A, n = 107) or not (Group B, n = 101). The two groups were then compared with a view to finding factors that distinguish one from the other. The total sample of 208 was subject to this multivariate analysis where gender, age, experience and whether they worked alone or collaboratively were the variables. With reasons for signing up being similar for the two groups, the aim is to look for other variables that might be relevant.

The results are printed in Table 5.3 (below). *Odds Ratios* (OR) are calculated with a reference value (ref) set to 1,0 and confidence intervals (CI) at 95%. The ratios express the increased possibility of the independent variable having an impact on the dependent variable.

The column marked *Crude* consists of bivariate analyses that are not controlled for other factors than one independent variable at a time, while the column marked *Adjusted* consists of the multivariate regression analysis controlled for all independent variables to establish the relative impact of each one.

Table 5.3 Factors associated with completion of course.
Odds Ratios = OR, Confidence interval = CI. (n = 208)

	Crude		Adjusted	
	OR	CI	OR	CI
Gender				
male (ref)	1,0		1,0	
female	1,0	0,6 – 1,8	1,2	0,7 – 2,4
Age				
>47 (ref)	1,0		1,0	
48 - 53	0,7	0,4 – 1,4	1,4	0,6 – 3,2
<54	0,8	0,4 – 1,5	2,1	0,8 – 5,7
Collaboration				
no (ref)	1,0		1,0	
yes	3,2	1,8 – 5,8	3,5	1,9 – 6,6
Number of years of experience				
>16	1,0		1,0	
17 – 25	1,3	0,7 – 2,5	1,4	0,7 – 10,7
<25 (ref)	2,4	1,2 – 4,8	3,9	1,9 – 6,6

The *Crude* column shows that the gender variable is not significant as a factor associated with completion of the course. Nor is age, although the odds seem slightly more favorable for the older segments. The number of years of experience is a more salient factor with increasing odds for completion correlating with experience as a teacher. Still, neither gender, age, nor experience can be said to be significant since the corresponding confidence intervals overlap the reference value of 1,0, except for the segment with more than 25 years of practice. However, a most significant factor is whether participants collaborated or not with an odds

ratio of 3,2 in favor of those who did and with a confidence interval that does not overlap the reference value.

When the bivariate correlations in the *Crude* column are controlled for covariation in the *Adjusted* column, some of the factors gain importance. This is especially true of the collaborative factor and years of experience. But also noteworthy is that when the age factor is controlled for covariation, it changes values from 0,7 and 0,8 to 1,4 and 2,1 for the middle and older groups. This is an indication of age being a factor associated with completion of the course.

In other words, the findings indicate a positive relationship between completion of the course, long experience, and a collaborative approach. Similar findings are reported by in particular Egbert et al. (2002) in a study on CALL integration, but are also found in other reports on integrating technologies into classrooms (Karsenti et al., 2002; Zhao et al., 2002).

Based on the variables that make up the above multivariate analysis, the experienced teacher who collaborated with colleagues is typical of the ones who completed the course. However, it does not explain why many teachers dropped out of the course. Consequently, the following two tables look into reasons stated as to why participants completed or not.

Firstly, what are some of the reasons Group B state for not completing the course (cf question 7 in the questionnaire)? The reply categories and response rates are found in Table 5.4 below.

Table 5.4 Reasons given by Group B for not completing the course.
Reasons presented in descending order of means for the total sample

I did not complete the course because	Total	
	Mean	SD
I did not find the time	2,18	1,51
There was not sufficient support from my school	3,50	1,46
There was not sufficient or available equipment	3,78	1,57
The technicalities were too difficult	4,05	1,40
I did not agree with the approach in the course	4,54	1,13
I felt there would be too much work trying to integrate ICT in my class(es)	4,62	0,79
As a teacher I do not feel comfortable using ICT in class	4,83	0,59
I did not see its relevance for my work as a teacher of English	4,90	0,60
I did not see any potential for ICT in language learning	5,00	0,00
Other reasons	4,03	1,47

The results show that especially lack of time, and - to a lesser extent - lack of support are the two most common reasons given by Group B for dropping out. As for lack of time, this should be seen related to Group A and how a collaborative approach to the course was one of the characteristics of this group. Time, although it may be said to be a universal, is culturally

appropriated so that people make it serve their needs. In the case of Group A, the time element has to a larger degree been distributed through social relations such as joint efforts, and shared experiences. In other words, collaborative activities are cultural practices that have the potential to overcome some of the constraints of time seen as a linear constant on an individual level. This point is important since lack time is one of the recurrent themes in research on teachers and their use of technologies (Egbert et al., 2002). Also, in the present study 'lack of time' and ICTs as 'time consuming' are commonly brought up as obstacles to implementation (cf Chapter 5.6).

On the whole, salient reasons for not completing are attributed to practicalities involved[120]. To quote one of the more verbose informants (#202), explaining her/his failure to complete the course:

> *A combination of several factors, really. The course was very time-consuming. Sometimes all you need to go on is the push of a button. If it takes you three days to find out about that button… In a course like this you really need individual assistance, and that is not always available. The meeting at [name of school] was a good attempt, but it took five hours out of an afternoon. To have to deal with pedagogical questions as well as learning the technicalities could be quite strenuous.*

As for reasons associated with lack of relevance or interest, they score consistently low. Also, it is worth noting that the alternative addressing possible lack of potential for ICTs in language learning does not receive a single entry (mean = 5.00). There does not seem to be any significant differences between women and men regarding reasons for not completing, although the mean for lack of time is notably higher for men, 1,91, compared to 2,39 for women (not shown in table).

Group A were asked why they completed the course (question 9 in questionnaire). Replies are arranged in Table 5.5. below.

[120] This is emphasized by quite a few respondents adding comments on the submitted questionnaire, explaining that they dropped out because of extended illness, change of responsibilities in the middle of the school year, divorce etc. To the researcher this is an intriguing example of transforming a particular tool, the questionnaire, so that it transcends a limited and formulaic genre and takes on characteristics of a personal note. A case of appropriation of a tool.

Table 5.5 Reasons given by Group A for completing the course.
Reasons presented in descending order of means for the total sample.

I completed the course because	Total	
	Mean	SD
I saw new opportunities in teaching and learning English	2,71	1,58
I felt the course to be relevant for my work as a teacher	2,90	1,41
I wanted to learn about the technology	3,64	1,60
I felt I was obliged, it was a matter of principle to me	3,80	1,57
I was able to use course content (ideas, tips, articles, discussions…) in class	4,08	1,28
I gained theoretical insight in my field as a teacher of English	4,52	0,97
I felt I improved as a teacher	4,58	0,94
It was fun	4,71	0,76
I got to know fellow teachers in the field	4,75	0,71
I felt my role as a teacher change and I liked it	4,82	0,56
Other reasons	4,86	0,67

Two reasons are highly salient. According to Group A, new opportunities in EFL learning and teaching, together with relevance for their practice, are the principal factors for completing the course. These findings sustain the reasons for signing up in the first place, which might be termed professional development (cf Table 5.2 above). On the whole, utilitarian aspects dominate while reasons associated with new teacher roles, theoretical insights and applicability in class all score, but all fairly low with a mean value above 4. There is one instance of some difference associated with gender; women have to greater extent than men been able to use course content in their practices (3,90 vs. 4,30, not shown in table).

Table 5.5 concludes the findings concerned with the first research issue as stated in Chapter 5.3. The results gathered from tables 5.1 – 5.5 suggest that Group A and B do not differ regarding reasons for signing up. A desire for increased professionalism dominates. Based on the responses, Group A completed the course due to its relevance and opportunities they see for EFL while Group B dropped out due to what they see as lack of time and support. However, the fact that Group A is more experienced and represents a more collaborative approach to the course is significant.

This concludes a statistical analysis of participatory patterns in *The Tower* sample. From here on only Group A will be the object of study (meaning that the term *participants* equals Group A). Three issues are raised: firstly how respondents replied to the forced-choice questions relating to ICTs, EFL and teacher and learner roles; secondly, how respondents replied to the open-ended ones, and thirdly an analysis of teachers' participation in the online discussion forum. (Note that in the online setting there is no way of determining whether participants belong to Group A, Group B or are among the ones who did not return questionnaires).

5.5. Survey: forced-choice questions

5.5.1. Beliefs about language learning and ICTs

Turning from the first research issue regarding participation to the second research issue, the questions now concern beliefs about and attitudes to ICTs in EFL among the teachers (in Group A) who completed the course. In Table 5,5 above, we see that course relevance receives a fairly high score. However, as the course covers a series of didactic and technical topics, it is necessary to ask what particular aspects of the course Group A felt were relevant, and to what extent (cf question 11 in the questionnaire). The results are presented in Table 5.6 below.

Table 5.6 Relevance of the course.
Modules presented in descending order based on percentages in the 'fully agree' category (n = 107)

I found the following topic(s) to be very relevant for me as a teacher of English:	Percentages for total sample			
	fully agree	partly agree	partly disagree	fully disagree
Information Retrieval	44,6	50,5	3,0	2,0
Communication and Cooperation	32,3	53,1	13,5	1,0
Presentation and Publication	30,9	44,7	18,1	6,4
Problem-based Learning	30,3	57,6	12,1	-
Use of Support Programs	30,0	58,0	12,0	-
The Discussion Forum	25,5	40,8	28,6	5,1
Pupil Autonomy	24,2	55,6	18,2	2,0
English for Special Purposes	23,7	46,2	21,5	8,6

As for relevance, all the modules of the course score consistently high, with *Information Retrieval* coming out far ahead of the others. This module was the first one to be offered, which also may explain its saliency. While some modules might be said to have a more 'theoretical' profile (e.g. *Problem-based Learning, Pupil Autonomy*), they do not score much differently from the ones with a more 'technological slant' (*Presentation and Publication, Support Programs*). *English For Special Purposes* and the *Discussion Forum* (strictly speaking not a module but a service required to be used) are not found relevant for approximately one third of the participants. This fact must be considered in light of fewer teachers representing vocational areas of study and the novelty (at least at the time) of an online forum. The results indicate that the course was well received by the participants and that it met professional needs, especially the modules that required networked technologies.

Following the question of relevance comes the question of *effect* the course might have had on participants (cf question 12 in the questionnaire). The term *effect* in the questionnaire is not intended to address a cause – effect relation, but as a lay term used to elicit response. The alternative responses listed are in the present study understood as adding up to dimensions of *appropriation*. Possible 'effects' are thus not restricted to instrumental appropriation but also related to participants' work practices, transformative potential of ICTs, and how participants

see their roles as teachers, i.e. conceptual as well as cultural appropriation (cf Chapter 2.3.5). Results are presented in Table 5.7 below.

Table 5.7 Effects of the course as perceived by participants.
Effects presented in descending order of means for the whole sample.

The course had the following effects on me:	Total	
	Mean	SD
I can integrate basic ICT like word processing, email, and Internet surfing in my work as a teacher	2,60	1,72
I see new possibilities for pupils improving their proficiency in English	2,96	1,40
I can integrate software and Internet services in my lessons according to my needs	3,50	1,57
I believe ICT will have a profound impact on the way we live, learn, and think	4,07	1,24
I believe ICT is not as important as many would like us to think	4,45	1,01
No/Little effect, because I was already familiar with ICT in EFL	4,53	1,20
I am part of a network of teachers	4,55	0,96
My work as a teacher has become more meaningful	4,64	0,82
I still cannot integrate ICT in my work as a teacher	4,78	0,82
I do not se ICT improving pupils' proficiency in English	4,85	0,60
My work as a teacher has become more difficult	4,87	0,82
Other reasons	4,66	0,96

The results show that participants mostly attribute effects of the course to increased instrumental mastery of technology and the potential ICTs might have for learners. Also, the ability to implement basic ICTs coming out as the primary category indicates that these participants did not possess particular ICT competence prior to the course. Negative effects are hardly noted; it is e.g. interesting to see how this sample does not see ICTs making their work more difficult. Effects associated with changed roles score low, but such effects might need a more longitudinal perspective to materialize. Although several categories have a fairly low score, it is noteworthy that all are listed among the five alternatives to be ticked off, suggesting that the sample recognizes a series of effects.

Taken together, tables 5.6 and 5.7 indicate that the sample has found the course to be valuable and conducive to their development as teachers. These findings can be used to discuss future in-service courses pertinent to ESL and ICTs. The findings would seem to suggest that a purely instrumental approach would be losing out on very important issues associated with innovative and transformational potential of ICTs.

When pursuing teachers' beliefs concerning technology, some studies have analyzed the relationship between teachers' use of technology and the learning paradigm they identify with

(Becker, 1999, 2000; Fulton, 1999; Gobbo & Girardi, 2001; Murphy, 2000)[121]. Such a line of inquiry is beyond the scope of the present study. However, in order to have some indication of this sample's view of language learning, question 19 asked about participants' beliefs regarding learning a foreign language. Three pre-defined options were given, loosely reflecting a) a structural approach often associated with the grammar-translation or audio-lingual schools and behaviorist perspectives, b) a communicative approach often associated with the natural approach and cognitive/constructivist perspectives, and c) a participatory approach that emphasizes interaction, output, and sociocultural perspectives. Of course, the researcher's intentions when setting up the three alternatives may not be perceived similarly by the participants and, hence, one needs to be extremely cautious when inferring from response. Still, these views are pertinent when it comes to getting a better understanding of how participants view technology in learning and teaching. Implementing technology, a cultural artifact, should not be seen as separated from teachers' general beliefs about language learning. The reason is that these beliefs are culturally constructed through educational rhetoric found in curricula and other policy papers (cf Chapters 3.4 and 3.13 for more on such aspects). In addition such beliefs will be formed through the substantial teaching experience represented by this sample. In other words, such beliefs are formed as part of teachers' participation in educational discourses, articulated through constructs, i.e. intellectual tools. Table 5.8 (below) shows the distribution of beliefs.

Table 5.8 Beliefs regarding learning a foreign language

I believe learning a foreign language to be the result of:	a) The pupil acquiring the structures of the foreign language	b) Meaningful input that triggers learning capacities in the pupils' mind	c) The pupil participating in social interaction
Total sample, percentages	10,6	49,0	40,4

Results show that the sample is firmly rooted in the communicative approach that has had an increasing impact on foreign language teaching in Norway since 1975 (Simensen, 1998:118); partly adopting the natural approach and the input hypothesis associated with Krashen (1992; 1983), and partly adopting an interactionist approach associated with the frameworks of e.g. Swain's output hypothesis (2000) and Kramsch's classroom discourse (2000a). When in the following the participants' views of ICTs are analyzed, it is important to relate these to the sample's overall view on language learning as basically communicative-oriented including constructivist as well as socioculturally related practices. The implication (also suggested by findings in tables 5.9 and 5.11 below) might be that for these teachers ICTs are not seen as primarily enhancing certain linguistic skills but as extending opportunities for communication.

Questions 13, 14, and 15 were posed in order to elicit teachers' beliefs about aspects associated with what ICTs might mean for learners and the roles they play *in society* and the *school subject* of EFL including classroom practices. Together, these questions are intended

[121] These studies show that teachers' personal theories of learning and teaching interact with the way they use ICTs. For example, teachers who are constructivist oriented often use ICTs for creative and communicative purposes, also beyond the classroom, while transfer oriented teachers often use ICTs to remediate and reinforce skills (if they use ICTs at all).

to elicit a more comprehensive view of ICTs than an instrumental and skills-oriented approach might do.

Question 13 asked what beliefs participants have concerning the effects of ICTs on some outcomes of educational importance, partly associated with language specific features, partly with aspects associated with learning in general. Results are shown in Table 5.9 below.

Table 5.9 Beliefs regarding effects of using ICT in EFL.
Beliefs presented in descending order of means for the total sample

I believe the use of ICT in EFL has the following effects:	Total	
	Mean	SD
ICT is motivating for the pupils	2,08	1,46
ICT demands new types of tasks and activities	3,49	1,57
ICT results in plagiarism	3,86	1,33
ICT increases pupils' vocabulary	3,97	1,17
ICT causes more superficial learning	4,27	1,31
ICT makes pupils collaborate more than before	4,37	1,17
ICT increases reading skills	4,39	1,16
ICT empowers the pupils	4,58	0,97
ICT makes pupils write more English than before	4,63	0,90
ICT increases writing skills (discourse competence)	4,69	0,81
Hypertext is confusing for the pupils	4,91	0,47
ICT causes more in-depth learning	4,91	0,47
Other beliefs	4,92	0,30

Motivation is by far the most salient category. Also, the low SD of 1.46 indicates strong agreement in the sample. This finding is supported by other studies of the impact of ICTs in the classroom (Garner & Gillingham, 1996; KUF, 1998; MacDonald, Shiozawa, & Ozeki, 1995; Schiefelbein, Imamura, & Ozeki, 1995; Schofield, 1995). It is worth noting that a clear second choice is technology's impact on the type of tasks and activities to be used in EFL, an indication of potentially transformed practice. As tasks and activities, along with an approved selection of texts, usually make up the EFL curriculum we see how these teachers are sensitive to the transformation of such curricular constituents. When the category of tasks and activities is checked for gender bias (not shown in table), there is a clear difference with the female segment of the sample showing a mean of 3,23 compared to the male segment showing a mean of 3,82. The difference of 0,59 is substantial, suggesting that the female share of the sample is more sensitive to transformation of practices. The saliency of this belief is

also interesting in view of choice number three, plagiarism[122], and points towards new designs for tasks and activities in ICT-infused classrooms. (This issue of tasks and activities will be illustrated in Chapter 6). With the exception of the belief that ICT increases learners' vocabulary, the remaining categories (covering increased reading/writing skills, pupil empowerment, in-depth learning and collaboration) all score between 4,3 and 4,9. It seems as if the participants find ICTs to have more impact on how to go about teaching than on learners' proficiency. Again, this points towards the transformational potential of technologies.

While question 19 asked about participants' more general views on language learning (reported in Table 5.8 above), question 14 was included to tap into participants' more general views of ICTs in society. The rationale is that ICTs are seen as artifacts, cultural tools that affect not only the way we learn but also the way we live and work. ICTs, by connecting school and out-of-school practices, possess a potential for transcending traditional classroom constraints. Thus, which societal roles participants assign to ICTs are an indication of how they view this potential. Findings are presented in Table 5.10 below.

Table 5.10 Participants' views on ICTs in society.
Beliefs presented in descending order of means for the total sample

My general view of ICT in society is that it is:	Total	
	Mean	SD
a tool for writing and information gathering	2,54	1,59
an arena for communication	3,02	1,36
an extension of the classroom	3,39	1,50
a learning environment for new insights	3,90	1,47
a world outside the classroom	4,11	1,36
an integrated part of our lives	4,24	1,14
a tool that makes learning more effective	4,60	0,97
a meeting place for humans and technology	4,67	0,79
a representation of knowledge	4,75	0,84
other beliefs	4,95	0,25

The first choice places ICTs in a mostly instrumental perspective, attributing to them qualities that facilitate certain human activities. Still, there are transformative qualities involved in writing (interactivity, hypertext) as well as information gathering (multiliteracies). ICTs as an arena of communication and an extension of our (learning) environment appear to constitute a strong second and third choice among respondents. The first five categories all have as a lowest common multiple the characteristic of transcending traditional classroom practices constrained by space, time and a fixed set of resources (blackboard, maps, books etc.) and bridging some of the gap between the classroom and the world outside. Through these five

[122] Plagiarism here refers to practices where learners cut and paste material from digital sources, particularly the Internet, and present this material as their own. Plagiarism was discussed in the online discussion forum of *The Tower*.

categories, aspects of the learning environment located at the interface of the physical and the virtual, the offline and the online, emerge. A more instrumental category, associating ICTs with more effective learning, scores fairly low. Low scores also go for the more 'philosophically oriented' categories suggesting a meeting between humans and technology.

Question 15 seeks to gain insight in how participants view the roles of ICTs in the EFL classroom. While Table 5.9 presented beliefs associated with effects of using ICTs (the *'what'* dimension), Table 5.11 (below) shows beliefs associated with processes (the *'how'* dimension[123]).

Consequently, the responses to question 15 about the role of ICTs in the EFL classroom must be seen in relation to the two previous tables. Results are presented in Table 5.11 (below).

Table 5.11 Participants' views on the role of ICT in the EFL classroom.
Beliefs presented in descending order of means for the total sample

In the English classroom, I see the role of ICT as:	Total	
	Mean	SD
facilitating learning about the English-speaking world	3,12	1,71
facilitating communication with others (peers, experts…)	3,61	1,49
facilitating authenticity in the learning situation	3,90	1,38
facilitating problem based learning (PBL)	4,07	1,40
facilitating language learning in new environments (simulations, virtual classrooms…)	4,10	1,35
facilitating learning across the curriculum	4,14	1,31
facilitating process writing	4,35	1,30
facilitating pupils' own construction of language skills	4,38	1,21
paving the way for new tasks and exams	4,49	0,97
facilitating cultural awareness	4,59	0,89
facilitating formal language skills	4,62	1,10
other roles	4,97	0,22

None of the categories gets a very high score, suggesting that several alternatives are first choice. Also, the high SD for the first category suggests that distribution of attributed values is high. However, the categories that are chosen most frequently can be summed up in access to authentic information and communication practices. Taken together, these choices indicate that for the participants, the learning environment changes when making use of ICTs in the sense that it more easily connects to the world outside the school gates. This is brought into perspective with an instrumental alternative like 'facilitating formal language skills' scoring only 4,97. There are a few differences between women and men (not included in the table)

[123] These two dimensions are, along with the *'why'* dimension, the classic didactic dimensions that we now see extended to *'when'* and *'where'* dimensions as indicated by the response presented in Table 5.11. Cf Chapter 3.9.4 for more on this.

with women placing more emphasis on authenticity in the learning situation than men (3,63 vs. 4,25) and men placing more emphasis on learning across the curriculum than women (3,89 vs. 4,31) and new tasks and exams (4,25 vs. 4,65). These differences would seem to point to different dimensions of the same phenomenon, i.e. new practices, and not contrary beliefs.

The findings presented in Tables 5.9 – 5.11 point towards a discussion of participants' perceptions of the more didactic and social implications of technologies. When teachers engage in practices where technologies play an integrated role, these beliefs will become part of their professional identities (cf Chapter 5.5.2 below). Such professional identity is closely related to the current status and identity of the subject taught. EFL, like any other subject, is always (re-)configured in view of its cultural-historical and social context. As was discussed in Chapter 3, English, as well as the way it might be taught and learned, is currently undergoing dramatic changes. This, again, involves changes in practices where EFL is the linguistic code. In the present study, such reconfiguration is seen as a cultural re-orientation influenced by our practices with and within networked and digital technologies. For the researcher, it will be necessary to refer to such issues when interpreting activities and choices made in the classroom. Consequently, how participants in *The Tower* perceive their own role in technology rich environments is illustrated in the next section.

5.5.2. Beliefs about teacher roles

We now turn from participants' views on technology in the subject, classroom, and society and to the third research issue; participants' perceptions of teacher roles and identity in an ICT-rich environment (tables 5.12 and 5.13 below). Questions 16, 17, and 18 seek to elicit responses that increase our sensitivity to this issue. There is no way to determine how participants define the concept of 'role'. However, Miles and Huberman's definition seems to capture the essence: "A *role* is a complex of expectations and behaviors that make up what you do, and should do, as a certain type of actor in a setting – a family, a classroom, a committee, a hospital, a police department, or a multinational corporation" (1994:122, emphasis in original). Such expectations are, obviously, defined by norms that again are constructed at a particular time and by certain societies or communities.

However, as was discussed in Chapter 3.10, teacher and learner roles might be seen to converge, both as a result of a reorientation of learning and teaching as taking part in social practices as well as a result of how ICTs tend to disrupt and transform established roles in the classroom. In other words, the social and cultural circumstances that influence a particular role change. But learning and teaching are not just about exercising institutionalized roles, the question of identity also arises: "Identity is the way that people understand their own individual experience and how they act and identify with various groups" (Sachs, 2001:4). This individual/collective perspective involves construction of self from cultural attributes. In other words, it is about being members of a discourse community, e.g. speakers of EFL. For teachers, "it is not so much by the specific content of their pedagogy as by their status as members that they take part in the general encounter" (Wenger, 1998:276). This involves *identity* and not just *role*. Wenger emphasizes identity as perhaps the most influential didactic element: "If the pedagogical and institutional functions of educators completely displace their ability to manifest their identities as participants in their communities of practice, they lose their most powerful teaching asset" (op.cit.:276). The *lived authenticity* brought into the classroom and the school subject brings legitimacy and connectedness to such authenticity. To Wenger, teachers' lived authenticity is an essential requirement for teaching because it serves as an invitation to have learners bring their own identities into participatory practices. Such

identities are not fixed or stable but "rich and complex because they are produced within the rich and complex set of relations of practice" (op.cit.:162). Wenger concludes that,

> *By this I do not mean that adults must be role models in a dramatic fashion. The main point is not to be exemplary in any idealized sense – though some authentic ideals can be helpful – but rather to act as members and engage in the learning that membership entails, and then to open forms of mutual engagement that can become an invitation to participation (op.cit.:277).*

and that, "it is as learners that we become educators" (op.cit.:277). Such a view establishes an understanding of identity as being social, negotiated, part of a learning process, and an interplay between one's own lifeworld, local and global perspectives, i.e. identity as relational. In the context of foreign language learning, this is illustrated in a study by Boxer and Cortéz-Conde (2000:216) that concludes: "The ESL teacher is a bridge between the classroom community and the societies whose cultures the language represents". This 'bridge' requires a relational identity, which, according to the researchers, can more easily open dialogue and dispel teacher and learner stereotypes.

In the present survey, the term 'role' was chosen since the notion of *teacher role* is a well-established lay term and identity was seen as ambiguous or confusing. Also, the options presented in question 16 are closer to those associated with institutional expectations than those associated with identity as presented in the previous paragraphs.

In the following paragraphs, participants' opinions on some roles that might emerge in ICT-intense settings are sought elicited (question 16). This is followed by participants articulating how they perceive certain aspects of teachers' roles and identities when working with ICTs (question 18). Finally, the issue of working between the physical, co-located classroom and the virtual, online environment is addressed (question 17).

Responses to question 16 are presented in Table 5.12 (below).

Table 5.12 Participants' beliefs regarding roles in an ICT-rich environment.
Results presented in descending order based on the percentage of replies. For the 'decisive' category only, the percentage for the total sample is given (n=107)

The teacher's role in an ICT-rich environment is to be:	decisive			a major role		a minor role		not important	
	total	women	men	women	men	women	men	women	men
highly skilled in English as a foreign language	37,9	36,7	40,5	50,0	52,4	13,3	7,1	-	-
able to evaluate Internet resources	37,5	42,6	31,0	52,5	66,7	3,3	2,4	1,6	-
highly skilled in didactics and pedagogy	34,7	36,2	31,0	50,0	52,4	13,8	14,3	-	2,4
designer of learning situations	21,2	22,4	20,0	56,9	70,0	15,5	10,0	5,2	-
a facilitator	20,6	13,6	31,0	67,8	57,1	18,6	11,9	-	-
inventive	18,4	21,7	14,3	68,3	78,6	8,3	7,1	1,7	-
a researcher on one's own practice in the class-room	17,0	10,2	25,0	67,8	62,5	15,3	12,5	6,8	-
an instructor	16,5	11,7	23,8	50,0	45,2	38,3	26,2	-	4,8
an interpreter of resources in virtual space	16,3	10,7	24,4	51,8	53,7	35,7	22,0	1,8	-
a skilled navigator on the Internet	16,3	18,3	14,0	50	53,5	28,3	27,9	3,3	4,7
a catalyst for pupils' ideas	6,7	5,0	9,3	70,0	69,8	23,3	20,9	1,7	-
technically proficient	5,8	6.7	4,8	38,3	28,6	46,7	61,9	8,3	4,8
knowledgeable about software	3,0	-	7,1	47,4	33,3	49,1	57,1	3,5	2,4

It should come as no surprise that the most decisive teacher role is the one associated with expertise in the subject taught, EFL. However, very close is the role as an evaluator of Internet material. This is a new role and one that demands critical literacy. It is followed by

high scores for roles suggesting new practices (designer, navigator, interpreter, researcher). The more traditional role as instructor is still regarded as important, but more so among men than women.

Concerning the more technically oriented roles, the figures speak clearly. Roles associated with hardware and software expertise are hardly believed to be decisive and the majority of both women and men consider these to be of minor or no importance. On the other hand, to be highly skilled in didactics and pedagogy gains a high score with both women and men.

The figures show differences between women and men on some issues. On the whole, men seem to be more willing to make use of the '*decisive'* extreme of the scale and – when compared to women – particularly so for the roles of researcher, interpreter, instructor and facilitator. However, when cumulative percentages for the two dimensions '*decisive'* and '*major role*' are calculated, the difference evens out, suggesting that this is a matter of degree of attitude or belief rather than a marked difference in preferences. When the '*minor role'* and '*not important'* dimensions are observed, there seems to be a difference; men attach greater importance to teachers as researchers on their own practices and women attach greater importance to technical expertise and knowledge of software. Both teacher-centered and learner-centered roles are regarded as important by *The Tower* sample.

In conclusion, the findings indicate that a series of new roles do not replace but are *added to* the more traditional roles associated with knowledge transfer and instruction. Consequently, being a teacher seems to be a much more complex profession with the advent of ICTs, but that the complexity is not primarily associated with technicalities. It is how technologies interact with knowledge domains, didactics, literacies, and designs for learning that adds to the complexity. Instrumental mastery of technologies has often been the backbone of in-service training with ICTs, regarded as the key to making teachers become users of ICTs. Such a policy is not supported by these findings.

With question 16 having brought into the open opinions as to what roles are considered important, question 18 seeks to tap into participants' beliefs concerning their identity and value as a teacher of English when adopting (some of) the roles in Table 5.12. Anecdotal material on teachers' insecurity, inability, bewilderment, and even hostility to ICTs is abundant. Admittedly this 'ICT-seasoned' sample, having completed the course, does not represent the heterogeneous population of teachers. All the same it is interesting to see how *The Tower* teachers perceive their roles in ICT-rich settings. Table 5.13 (below) presents an overview.

Table 5.13 Participants' beliefs regarding identity and value in an ICT-rich environment.
Results presented in descending order based on the percentage of replies. For the 'fully agree' category only, the percentage for the total sample is given (n=107)

As a teacher of English in an ICT learning environment:	fully agree			partly agree		partly disagree		fully disagree	
	total	women	men	women	men	women	men	women	men
I believe I have valuable professional qualities to offer	47,1	41,4	53,5	53,4	44,2	5,2	2,3	-	-
I believe it demands more of me as a professional expert on language learning	30,7	33,3	27,9	43,9	53,5	21,1	14,0	1,8	4,7
I feel I am working in between two complementary environments (physical and virtual)	27,0	29,3	24,4	43,1	56,1	19,0	12,2	8,6	7,3
I believe I have expertise that is needed	25,5	19,0	34,9	56,9	44,2	22,4	20,9	1,7	-
I believe I am more useful than ever	20,8	21,1	20,9	43,9	48,8	24,6	25,6	8,8	4,7
I feel my identity as a teacher grows stronger	19,8	21,1	18,6	38,6	37,2	33,3	41,9	7,0	2,3
I do not believe in the distinction between physical and virtual environments	13,7	14,5	12,8	49,1	59,0	27,3	17,9	9,1	10,3
I feel I am working in between two incompatible environments (physical and virtual)	1,0	-	2,4	10,9	23,8	34,5	31,0	54,5	42,9
I feel my identity as a teacher is taken away	1,0	-	2,3	10,2	11,6	25,4	32,6	64,4	53,5
I feel marginalized	-	-	-	12,3	11,6	24,6	23,3	63,2	55,8
I feel insecure	-	-	-	29,3	39,5	31,0	23,3	39,7	37,2
I feel lost	-	-	-	8,8	7,1	29,8	28,6	61,4	64,3

The data reported in Table 5.13 highlight three issues concerning identities and values. The first one concerns teachers' professionalism. The percentages suggest that the teachers consider they have much to offer while at the same time demands on them have increased. It

may seem as if these teachers feel there is a need for increased professionalism. There is no marked difference between women and men, although men seem to feel somewhat more self-assured than women.

The second issue concerns how participants' perceive issues of teacher identity. While there is some indication of insecurity, the figures cannot be said to support any strong or widespread feeling of loss of identity or marginalization. On the contrary, 55-60% of the sample seems to experience a stronger sense of identity working in a technology-rich learning environment. It is interesting to note this sense of identity growing stronger considering the third issue of working in offline and online environments (below). There is no marked difference between women and men in this respect.

The third issue concerns working at the interface of a physical, co-located learning environment (classroom) and a virtual, online learning environment (Internet). This issue represents new aspects of the teaching profession. In tables 5.10 and 5.11, teachers expressed, among other things, beliefs in ICTs transcending the walls of the classroom and the above data indicate in what ways this affects them. What emerges is a situation where two spatial and temporal dimensions converge; the interface between the physical and the virtual environment becomes a new territory for teachers. While 26,2% of the male respondents feels that there is some incompatibility between these environments, this feeling is shared by only 10,9% of the female respondents. Apart from this finding, the responses indicate that participants find the two environments to be complementary. Other researchers have also argued for the *complementarity* of offline and online environments (Leander & Johnson, 2002; Warschauer, 2000a). The present study argues that this view is supported when we study teachers practicing at this interface, cf. Chapter 6.

The issue of virtual vs. physical environments is of particular interest with the rapid deployment of broadband technologies in schools, facilitating networked and distributed learning environments at increasing speed. Consequently, this issue is pursued in question 17, asking to what extent participants feel they work at the physical, 'traditional' or the 'virtual' end of the continuum. The response is illustrated in the bar chart in figure 5.3.

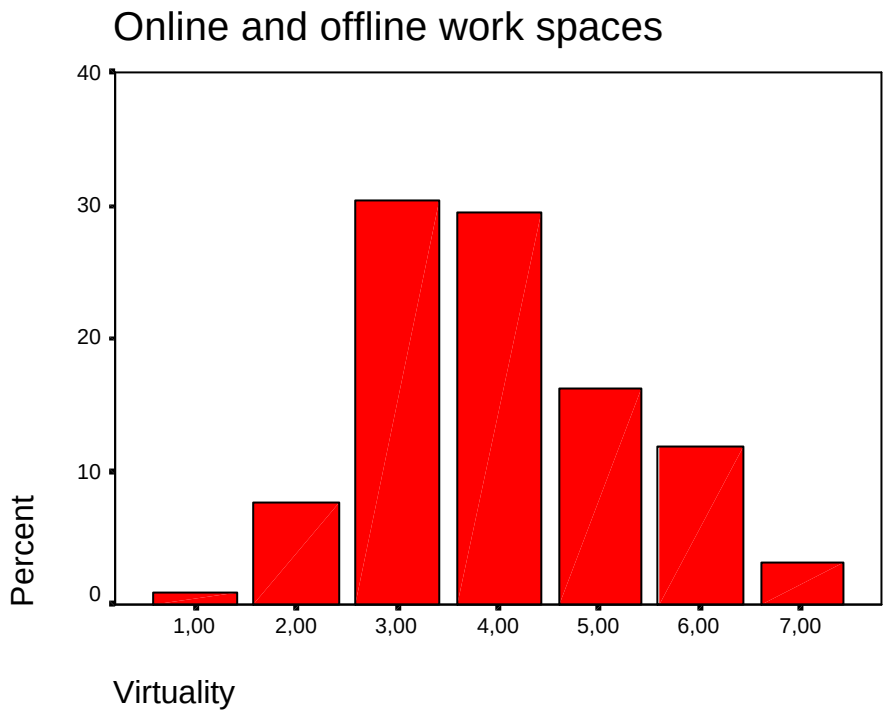

Figure 5.3: Bar chart with participants positioning themselves at the interface of physical and virtual learning environments. The horizontal scale represents a continuum from 1 = traditional learning environment only (classroom) to 8 = virtual learning environment only (networked, distributed environments). Middle scores indicate a mix of the two environments. (n = 107)

The bar chart in Figure 5.3 shows how the participants identify their sense of place when virtual, online environments become an added dimension to teachers' workplace. The mean value for the total sample is 4,01 with a standard deviation of 1,29, which shows that values are not too distributed along the scale (but somewhat skewed to the right as shown in Figure 5.3. The data have been checked for gender dependent correlations but without any significant difference, although the figure will be slightly skewed to the left for women and to the right for men. To the researcher, the mean value is unexpectedly high, considering the relatively short history of online opportunities in the classroom. Combined with the finding that a majority of respondents find offline and online environments to be complementary (cf Table 5.13) this might mean that (anecdotal) teacher resistance to networked, online environments is exaggerated or can be overcome given the right type of support.

To conclude the issues of roles, the results indicate that the participants believe their roles both change and become more demanding and more complex. They believe they are valuable and have a lot to offer and that - despite some insecurity - they have a strong and even growing sense of teacher identity amidst the rapidly changing learning environment. Also, they seem to have a distinct feeling of working in the middle of a physical and a virtual learning environment.

In order to pursue the participants' experiences, thoughts and beliefs associated with ICTs in EFL, seven open-ended questions (questions 20 – 26) were asked. These questions give the participants an opportunity to raise issues not touched upon in the forced-choice sections of the questionnaire. An analysis of findings from this section will be the subject in the next section.

5.6. Survey: open-ended questions

As discussed in chapter 4.6.3 on methods, the open-ended section of the questionnaire (questions 20 – 26) provides respondents with an opportunity to address the issues that concern them most, rather than the issues that concern the researcher most. Open-ended questions (or, to be more precise: invitations to comment) have the advantage of being conducive to opinions, attitudes, and ideas that otherwise would have been hidden from the researcher. The questions intended to bring out important and unexpected insights from *The Tower* course, and also participants' ideas on changes and advantages as a result of ICT integration as well as ideas about pre- and in-service education. Respondents could reply in English or Norwegian.

Of the 107 informants in Group A, 92 (86%) answered the open-ended questions. These 92 teachers form the sample referred to in the present chapter. To fill in open-ended questions places more demand on respondents; they must articulate their ideas instead of just ticking off alternatives. The high percentage of respondents suggests that these teachers felt compelled to voice their ideas and concerns, that there were issues that concerned them greatly. Many wrote to great length, and often with emotional commitment.

Answers to questions 20 – 26 were coded and analyzed, and categories established by way of content analysis reflecting recurrent topics in the answers (cf research method and Grounded Theory in Chapter 4.6.3). Categories were ranked in descending order by number of responses found to belong to that category. They have not been numerically counted or expressed in terms of percentages, the reason being that here, the *quality* of something might be more important than the *quantity* of something. It is the different timbre of voices that are important and not so much how many who reach the same pitch, a belief can be compelling even if only one person holds it. Moreover, a quantification of responses would infringe on the many cases of multiple responses to the same question; several informants gave more than one comment on one issue.

Table 5.14 (below) gives an overview of the findings with categories in bold letters followed by keywords suggesting what the category entails.

Table 5.14 Open-ended questions and response categories from *The Tower* (n=92).
For each question (or invitation to be taken up) categories are ranked in descending order according to number of responses that fit the category

Questions 20 - 26	Categories
20: The most *important* thing(s) I learned from this course is/are:	• **Application** (technical insights and skills put to use) • **Innovation** (new practices, roles, theoretical insights) • **Fascination** (the endless possibilities) • **Confidence** (familiarity with ICT brings self-assurance) • **Ambivalence** (possibilities balanced by limitations in hardware/software, time-consuming, help-intensive)
21: The most *unexpected* insight for me has proved to be:	• **Appropriation** (ability to implement in practice and projects according to needs) • **Learner empowerment** (access to authentic resources to be used) • **Disillusion: practicalities** (time consuming, fragile technology, lack of school support) • **Disillusion: people** (traditionalism among colleagues, pupils' lack of focus and cheating by cutting and pasting material)
22: The biggest *change* for a teacher going from a "traditional" to an ICT-rich learning environment in EFL is:	• **Loss of teacher's control** (less transparency and predictability, more difficult to monitor class) • **Learner empowerment** (autonomy, authenticity, resources) • **New teacher roles** (facilitator, serve new generation of learners) • **New designs** (Problem Based Learning, networked communication, new literacies) • **Time consuming** • **Human-Computer relations** (dependence on technology)
23: In EFL, the *advantages* of an ICT learning environment are:	• **Motivation** (variation, current and high quality material) • **Learner autonomy** (possibilities regarding differentiation) • **Possibilities** (updates, no limits…) • **Authenticity** • **Skills** (volume of output increases, more reading/writing, authentic usage) • **Suspension of constraints** (learner/teacher roles, home/school, time/space)
24: Regarding ICT, I think *pre-service teacher training* for future teachers of English should focus on:	• **Technical insight** (skills, use) • **Examples of good practice** (design) • **New learning and teaching parameters** (theory, ethics, literacies, new type of tasks)
25: Regarding ICT, I think *in-service training* for practising teachers of English should focus on:	• **Networked environments. Workshops.** • **Skills** • **Examples of good practice** • **New learning an teaching parameters** (theory, ethics, literacies, new type of tasks) • **Local Research & Development**
26: Additional comments:	• **Promote examples of participants' own practice** • **Local failure** (no school/administrative support) • **More initiatives like *The Tower*** • **Teacher an even more crucial factor** • **Time consuming**

The themes that make up table 5.14 will be illustrated in the following paragraphs. Conceptual categories (e.g. innovation) are sought illustrated on two levels; partly on an individual level by quoting certain informants who are found to offer perceptive responses, partly on a collective level by grouping teachers into "profiles" that illustrate a particular aspect of a category. Numbers in square brackets, e.g. [22], refer to the question in Table 5.14 above. Numbers in normal brackets identify the participants; i.e. they refer to the number given to the individual participant, e.g. (2). Where a participant's comment is translated into English it is indicated by a (T).

The responses indicate that many of these teachers are aware of the possibilities and innovative potential of ICTs while some also express reluctance and even skepticism towards technology. The middle ground is taken by the majority who express increased confidence due to their instrumental abilities. The importance of the course [20] is mainly found to be in how teachers have come to use ICTs, they have become active users and gained technological insight. However, several say how they perceive this as having transformational potential on their practices, e.g.:

> *First of all it inspired me to think of new ways of using ICT in the classroom. I read more about the subject and watched daily shows on Dot.TV where they have a series of masterclass (15 min.) programmes – very educational (2)*
>
> *ICT triggers pupils' learning capacity and my own learning capacity (6)*
>
> *Fascinating links to the real world. As I said earlier, pupils respect my knowledge of ICT (35)*

Words such as *inspire, new ways, more,* and *capacity* all point towards an expansion of professional repertoire. The third quote points to bridging school and out-of-school contexts as well as how this teacher's appropriation of the technology results in added professionalism recognized by learners. What emerges from responses to the first issue are two teacher profiles; those who have learned to use ICTs and those who have learned that ICTs have changed their working environment.

There are four major types of unexpected insights [21]. The first concerns participants' (sometimes unexpected) unexpected appropriation of the tools, that they have been able to adapt them to local needs. Many of the participants express joy at discovering that they could actually make use of the technology from professional, subject specific needs. This is followed by the realization of learner empowerment. Empowerment is attributed to mainly two concepts; learners' access to unlimited amounts of authentic learning resources and their opportunities for autonomous learning. However, some participants feel let down by flawed or inadequate technology and/or lack of support or understanding from colleagues and administrations. The issue brought about a wide range of responses, typical examples are:

> *That I can really use it in <u>my</u> teaching (25)*
>
> *The resources that can be used in daily life – we planned a "Passover Meal" for our parish, and prepared by engaging with Jewish sites in the USA which are now BOOKMARKED on our computer at home (37)*
>
> *Collaborative problems. How traditional we/most teachers think (66) (T)*

How difficult it was to combine the technical use of data with trying to learn new teaching methods (79)

Responses show that there is a tension between appropriation and the constraints found in traditional working routines and the physical and organizational environment. This tension tends to create two profiles of teacher profiles; those who place more emphasis on what they see as successful appropriation and those who see the constraints and complexities as intimidating.

Change is a *Leitmotif* in responses to the open-ended questions, and it is applied to several issues. It is found in answers to the question on the biggest change for teachers going from 'traditional' to ICT-rich learning environments [22], but is also found in responses to other questions. By far the most recurrent category presented in Table 5.14 is the one labeled *Loss of teachers' control*. As such, it is one of the recurrent concerns of the teachers in *The Tower*. The question is how the various teachers perceive *loss* and *control*. Some typical responses are:

Much more that can go wrong, impossible to be fully prepared (3) (T)

A more loose, less controlled learning situation (13)

The teacher does not know all the answers any more (23)

Learning to "let go" (33)

It opens up for immediate response from the world outside, and the pupils are responding (52)

A new kick as a teacher. More is left to the pupils (66) (T)

Must be on your toes all the time, cannot prepare for everything, must improvise (82) (T)

That you have to reconsider and reorganize your thinking, your methodology, your whole teaching pattern (90)

The above quotes indicate that loss of control is not necessarily a negatively charged concept. Questions of authority and control should be seen in relation to the added demands on teachers, the complexity of the emerging learning environment, and issues of roles and identity. The notion of control is differently constituted according to the type social discourse it is part of. Traditionally, teacher authority and control have been connected with the teacher's responsibility of attaining goals in the curriculum and preparing learners for exams. The above quotes signal a transfer of power, or rather, empowerment of the learner.

What we may see up close is teachers constructing a new understanding of their position in the ICT-infused classroom, a position that requires them to "let go" as informant 33 encapsulates this position. Other researchers (Meskill, Mossop, DiAngelo, & Pasquale, 2002) have also documented the unpredictability and risk-taking involved. Not all learners automatically benefit by a larger degree of autonomy. As several teachers point out there is need for didactic support that repositions the teacher so that her expertise can be tapped according to the demands of the more complex situation. Some point to a 'vacuum' that emerges when teachers leave a position involving more control. In the chapter on classroom encounters, this issue of 'abdicated power' also emerges, cf Chapters 6.6.1 and 6.9.3.

Also, the *loss of control* category reflects epistemological change. The above quotes point to how answers no longer are to be found with the teacher or the approved textbook, learners are no longer an audience. Such a shift involves new relations between the knower and the known. For teachers, it involves a change from providing knowledge to guiding and supporting a process of coming-to-know; activities that involve learners and teachers and that might be conducive to knowledge building. Such a change is also dependent on the conditions under which it takes place. In Chapter 6.5.3 this aspect will be pursued in relation to the different activity systems involved. In sum, the collective teacher profile that comes into view from question 22 is one that finds itself echoing a reconfiguration of practices, a process which is both welcomed and causes some apprehension due to its relative novelty, lack of fixed didactic points to go by, and organizational support.

Advantages of ICT in EFL [23] are most often associated with motivation, echoing findings from question 13 about effects. This is followed by categories relating to the possibility of transcending constraints of the physical, co-located classroom with its spatio-temporal limitations. The responses to this question address advantages in the learning situation more than advantages for acquiring language skills, e.g:

> *I discovered more about the pupils, their strong sides and weak sides in learning. Many pupils suffer from lack of concentration (6)*
>
> *Flexibility, differentiation, student autonomy, access to plentiful resources, input, maybe contact with native speakers, process writing (26)*
>
> *It flows in + out of their home use of the computer; and it's enjoyable for pupils – they like working with information-gathering, interactive programmes, contact with pupils in other countries (e.g. Canada: "Round The World in the Arctic Circle") (37)*
>
> *Independence of time and space (42)*
>
> *The feeling of "understanding" my pupils and their world (63)*

In a way, the responses can be seen as trying to fill the 'vacuum' and reconfigure the notion of 'control', referred to above. Although the question addressed advantages for EFL, respondents bring up larger issues connected to the learning situations and lifeworlds of their learners, elements that were seen as essential in the discussion of relational didactics (cf Chapter 3.11). The teacher profile on this issue is concerned with the human relations EFL enter into as ICTs are integrated, and not so much with possible skills reinforcement and improvement.

Regarding requirements for pre-service [24] and in-service teacher training [25] the responses are quite similar. Examples of good practice and a theory-informed approach are recurring as topics. However, participants voice a need for a more technical, skills oriented approach during pre-service than during in-service training. Responses regarding the latter suggest local networks (not necessarily digital) giving opportunities to disseminate teachers' own work in the field. Typical responses would be:

> *Updates on literature (…) Workshops to discuss and exchange and produce learning/teaching resources using ICT. Developments in the English language due to globalization and widespread use of English by non-native speakers, especially due to ICT (9)*

ICT does not solve all problems. It will be more important than ever to educate teachers with good skills that enable them to be critical and evaluate the material available on the net (22)

New paradigms of learning as a result of ICT (not specific software products, which would be outdated by the time they started teaching) (86)

As with responses to the previous issues, instrumental aspects of ICTs are balanced by concerns that address situatedness as well as larger social, cultural, and educational perspectives on teacher education and development.

This last perspective is also often brought up in the *additional comments* category [26] and with emphasis on the role of the teacher, e.g:

Personally, I would like to add that I don't take my classes to the computer room very often – except when they are working on a project. One reason is that the slowness of the link (ISDN) means that most of the time is lost because of waiting for a page to open, then a fairly free working style often means that pupils get lost and wander off into cyberspace. But there are also many other ways of exploiting this new resource: I compose small newspaper articles (up-to-date) that I hand out to the pupils. I have made several Power Point presentations that have been stored on our school's network (French culture, British and American government.) I also happen to give courses to my colleagues, since, in many ways, it's better to be taught by someone who teaches the same subjects (languages), and who therefore knows what is important to us. It's also extremely important, I think, that as many teachers as possible are familiar with the techniques and contents of ICT (2)

ICT is not the answer to even a small part of the problems in our modern schools. It can be motivating to some extent, but if all teachers use it in all subjects, that effect will also quickly wear off. The crucial factor is still the competent, highly motivated teacher who manages to cast a spell with his/her personality. It is therefore important to allow these teachers to have relatively free reins in this last free profession and not bury their enthusiasm below a burden of paper work, bureaucracy and control routines (22)

Today's school is not equipped to implement current views and visions on the use of ICT in teaching and learning. It is like drawing pancakes in home economics (39) (T)

Additional comments also concern organizational and practical constraints participants feel when investing time and effort in implementing ICT in their practice.

In conclusion, the results from the open-ended section indicate that participants eagerly seize the opportunity to reflect on the processes involved in *The Tower*, to address pressing concerns, and to give advice with regard to what they see as crucial for promoting ICTs in teacher education and in-service training. Reflections center on appropriation processes, learner and teacher roles, tasks and activities, and new didactic dimensions. Concerns are voiced regarding lack of time and support and the organizational aspects of schooling. Advice regarding future training and education comprises instrumental, exemplary, and theoretical approaches. Collaborative aspects are brought up, e.g. in the form of workshops and networks.

What also emerges from *The Tower* survey is a collective belief that sees ICTs as transforming conditions for learning and teaching more than enhancing certain language skills or making teaching more 'effective'. Although one key concern is instrumental mastery of ICTs, the data point to the importance of a situated approach to ICT implementation, i.e. technologies must be appropriated as they become interwoven in the practices of learners and

teachers. As discussed in Chapter 3, these practices are formed by the current, socioculturally constructed status and nature of the subject taught, the affordances and constraints of artifacts, and a perception of how (language) didactics are changing. Teachers experience an added complexity in such a situation but see this as a reason why they will play a key role in technology-intense learning environments.

With the open-ended section of the questionnaire triggering a voluminous response from participants, there is reason to believe that teachers do feel strongly about the issues raised. Are such issues also debated in the online discussion forum? What are the concerns of participants when there are no pre-designed questions and researcher-initiated issues? Although the data gathered from the discussion forum are of a different type than those from the forced choice questions, they are linked by the overall research issue, teachers' appropriation of technologies, and the fact that they emerge from the same research site, *The Tower*. Consequently, the discussion forum will be subject to a brief analysis in order to attain an even 'thicker' description of the phenomenon.

5.7. The Tower's discussion forum

5.7.1. Participatory genre: the multilogue

In the open-ended section of the questionnaire teachers voiced a need for networking and disseminating examples of good practice. There were ample opportunities for submitting examples to *The Tower*, and some were published. The online discussion forum was introduced and used right from the beginning, but as different counties started out at different times, the participants would have to negotiate their way into the forum with little guidance or mentoring while trying to catch up with the discussion at the same time. The forum interface presented the user with a set of frames. One showed the name, heading and date of postings, but not more than 7-10 at a time. Another frame showed the body of the posting selected, and the third offered interactive buttons to facilitate writing and posting to the forum. Thus, a global view of postings to the forum was not possible. The effect of both the limited view and the different sign-up times coupled with infrequent use by many indicate that the forum should be regarded more as a *participatory genre* than a true virtual community, although it demonstrates characteristics of the latter as well (for a discussion on *The Tower* as a possible community of practice, see Chapter 5.8 below).

An online discussion list may be conceptualized in different ways. Thomas Erickson (Erickson, 1997) from Apple Research Laboratories discusses the nature of online discourse in light of the "virtual community" metaphor (Rheingold, 1993), but rejects this as a conceptual framework in favor of the concept of genre. With its blurred line between author and audience, producer and consumer, Erickson sees online discourse as a participatory genre that has no parallel in 'traditional' discourse. Using the concept of genre moves the focus from community issues such as membership, personal relationships, and a mutual commitment resulting in a durable community to "the purpose of communication, its regularities of form and substance, and the institutional, social, and technological forces which underlie those regularities" (op. cit.:1). In addition, the participatory genre carries certain conventions and expectations that become essential in the discourse.

Hence, the use of genre seems appropriate when examining *The Tower* discussion forum. This type of participatory genre can be viewed as a shared artifact with its potential of accumulating instances of human interaction. Erickson, building on several scholars of genre studies, takes a situated approach to the concept of genre, defining it to be "typified rhetorical

actions carried out in response to socially defined, recurrent situations. That is, genres provide ways and means of accomplishing social actions in particular situations" (op.cit.:1).

In her PhD thesis on teachers of French and their beliefs as articulated in an online environment, Elizabeth Murphy (Murphy, 2000:5-6) makes use of the *multilogue* as a conceptual term for online discourse as found in e.g. discussion groups. After stating that a discussion list "provides in-depth information on the use of discussion as a means of favoring teacher talk, reflection and of bringing teachers' implicit beliefs to the explicit level', the author discusses in great detail the characteristics of such online forums. In addition to touching upon several of Erickson's characteristics (above), she emphasizes the oral quality of postings, the dynamics involved, and the multiple senders and receivers developing threaded exchanges that are persistent in the sense that they do not disappear after having been articulated. She concludes by agreeing with Gary Shank (1993) that a new linguistic model is needed, referred to as the *multilogue*.

Using the characteristics emphasized by Erickson and Murphy, the participatory genre of the multilogue as it appears in *The Tower* might be described in the following way:

The Tower's online discussion forum in the form of a participatory genre - the multilogue - functions as a shared artifact that mediates asynchronous exchanges in an online environment. These exchanges are carried by a shared interest, in a written form, and situated in conventions of participation that are particular to this genre.

Although the forum was within *The Tower* editor's 'jurisdiction', it was on the whole unmoderated. Also, the voices that speak through the discussion forum are not subject to the present researcher's interference and very rarely triggered by him (although he took part as one of the county administrators).

5.7.2. Patterns

With the participants having access to a discussion forum, it is interesting to analyze to which extent a participatory genre was used to address concerns similar to those elicited through the survey. A categorization of the postings[124], from the welcoming message by the editor on January 6, 1999 until June 13, 2000 (the last item of the spring term marking the end of the 'official' course period, and aptly titled 'Are good teachers born or made?'), is presented in Table 5.1.5 (below).

[124] Note that in the discussion forum there is no way of telling which participant belongs to Group A or Group B or who did not choose to return the questionnaire and thus does not belong to either group.

Table 5.15 Overview of activities in the discussion forum of *The Tower.*
Duration: January 6, 1999 to June 13, 2000. Frequency in numbers

Items	Number of postings
Total number of postings:	615
Number of participants taking part at least once	227[1]
Number of participants with five or more entries	20
Number of participants with only one entry	110
Highest number of postings from one participant	38[2]
Number of exchanges counting five or more messages	24
Most extensive exchanges on one topic:	
• Oral activity and reticent learners	62
• Literature for learners	35
• Teachers' (lack of) ICT competence	12
Content categories (descending frequencies)[3]	
• Utilitarian, altruistic exchanges (pointers to URLs, literature, software, and tips and advice on activities, current events, and projects/excursions)	274
• Exploratory exchanges (discussion on didactics and pedagogy including curricula, evaluation and exam types)	118
• Meta-level exchanges (participation, course profile, teachers' roles, educational issues)	81
• Discussion about course topics	55
• Reporting from excursions and conferences	21
• Presentation of products (teachers' and learners')	17
• Technical Q&A	10
• Other (tests, greetings)	30

[1)] The number is not exact due to the fact that some of the postings are anonymous
[2)] For comparison, 26 postings were written by the editor, 12 by the present researcher
[3)] Categories are not discrete. Some postings are borderline cases between e.g. activities and didactics or course topic and current events etc. Consequently, the number attached to each category is not exact, but suggests the relative strength of the category.

The 615 postings show that there was a steady and quite vital activity taking place in the forum. The 20 teachers who formed the backbone of the activity with <5 postings each, contributed in most of the categories in Table 5.15. A common characteristic of these participants is that they seemed to be experienced in ICTs and/or seemed to have developed a special interest in the field. Still, 110 teachers did not contribute to the forum after their first visit, although they might have followed the discussions as 'lurkers', a quite common phenomenon in online discussion forums. It is worth noting that the comparatively low number of postings by the editor qualifies this forum as an unmoderated type; it was up to participants and county coordinators to take initiatives and there was no attempt at directing or guiding participants towards particular issues or approaches. This gave the forum a 'grassroots' quality. The figures in Table 5.15 above suggest that this mode of communication (and its unstructured form) is not for everybody but that it does exhibit potential when the topic is felt to be relevant, controversial, represents a problem or a possibility for teachers.

This is reflected in the content of the categories in Table 5.15. The very high number of exchanges where teachers voluntarily share ideas, advice, practical tips and knowledge of

resources is an indication of a need that is difficult to meet except in online forums. The sheer number of URLs that was exchanged is proof of this, as well as all the suggested book titles and some software titles and general tips. A related category, presentation of one's own products (usually home pages) or pupils' products (home pages or projects), adds to this dimension. Some of the presentations and projects referred to in the forum were picked up by the editor and extended into examples of good practice in the relevant course module. Based on these findings, *The Tower* online community can be characterized as highly altruistic and very much practice-oriented.

The level of interaction in *The Tower* cannot be illustrated in full. However, the following two entries are typical for a utilitarian approach that extends into a more didactically oriented discussion (postings abbreviated and anonymized by the present researcher). The topic is synchronous chat, and was introduced by a question to the forum:

> From Karen, date: 16. November -99
> Subject: chat meetings
>
> ---
>
> Does anyone have experience in arranging chat (mIRC) meetings between students from different European schools? Our students would like to try to meet their project partners at a mIRC channel, and we are looking for tips, as to how to organize such a meeting. We have had similar meetings between the coordinating teachers.

The question produced five replies with suggestions, for example:

> Reply from Geir Ove, date: 20. November -99
> Subject: chat meetings
>
> ---
>
> Hi
> (…) A foundation class english in (name of county) and a group of Italian students worked together on a project. We used ICQ (www.icg.com) to communicate (both teachers and students). The students were organised this way: 4 students made a group. One PC pr student. So there were 5 groups in Italy and 5 groups at (name of school), Norway. One of our students (the icq expert) had registered 5 IDs (you need a number to be identified within the system, works like the phone book)
> The first meeting with the students in the two countries were of the 'get to know each other' type. The other icq-meetings were to be about the joint project.
> Everything that was said/written was logged and saved for later use. (Evaluation etc....)
> From a teacher's point of view: This worked with some groups. the initial meeting is always exciting. When we were to get down to business you soon found out who had done their homework and who hadn't.
> Technically speaking it worked without (hardly) any problems. The screen layout in chat mode is GOOD at icq. The logging of conversation was easy once you learned it.
>
> We were all present in the same classroom, I could (if needed) be asked for assistance. And I could make sure that they were 'chatting business'.
>
> Did they learn anything? Yes and no. I will use the 'realtime' conversation option in class when I have the right project and the right contacts in another country.

The topic proved to be persistent, and resurfaced throughout the course. The thread developed into a discussion on possible values of chatting and possible teacher resistance. In the following entry, quotes from other participants are introduced by a colon.

Reply from Vera, date 3. January -2000
Subject: topic 4

:Many teachers seem to be opposed to Chatting. If we impose some restrictions, could it be useful in any way?

I experienced something very interesting as concerns chatting just before Christmas. We were having a project work on the subject: prejudice and intolerance. I asked the students to interview 3 people not born in Norway and ask what they thought about Norway and Norwegians etc. (I am not going to write about the whole project - it was VERY interesting anyway). As we live in a small place there are not so many people here being born in other countries. Then some students asked if they could interview people they know on the net - what a success. We got opinions from Italy, Spain, Venezuela, New Zealand, South Africa and Brasil. They all had certain opinions about Norway and the students could start the discussion: What about our prejudices to people coming here from other places (as refugees e.g.)?

We were having some problems here at that time as concerns refugees from Kosovo - and the students started saying `them-the refugees etc` meaning one particular man who didn't behave (really) so you see that's the reason why I started the project.

:What restrictions would be relevant?

During a lesson when they are supposed to find information they are not allowed to chat.

Another characteristic of the postings is their exploratory nature. Participants discuss what the advent of ICTs in their subject involves in terms of didactics, activities, design for lessons or projects and new style exams. Typically, these postings are quite long, usually ½ - 1 page but sometimes even longer. They tend to pose questions, sometimes rhetorical, and often have a decidedly 'think aloud' quality to them. This interest in broader issues than just implementation of technologies is supported by the meta-level category that takes a wider educational and organizational perspective, bringing in issues such as (lack of) support from administration, educational policies, and reflections on participants' roles in both the course and when practicing in ICT-rich learning environments.

Further down on the list in Table 5.15 comes the category involving more obvious concerns relating to the course modules, while the purely technical issues constitute a minor category. The latter fact is interesting. It could mean that technical issues were raised and answered locally. But it could also mean that technical issues are seen as being secondary to the activities, possible uses, and reflections that involve ICTs. It is the overall learning environment that seems to emerge as the primary concern for these teachers. Again, the implication is that for ICTs in teacher education and in-service training they should be introduced as embedded in practices that involve the disciplines taught.

Moving on from the contents of the forum to the way discussions unfolded, the 'Discourse Architecture', several patterns emerge. Firstly, postings are relevant to the aims and topics of the course with less than 5% of the postings being irrelevant (e.g. greetings). Next, the postings cover a vast array of sub-topics within each of the categories in Table 5.15. Most of these sub-topics are treated as short bursts of exchanges, mostly involving 2-5 postings by 2-3 participants. Longer exchanges occur (<5 postings), but only 3,9% of the postings might be said to belong to this category. Certain topics do surface several times in between other exchanges, but on the whole the forum exemplifies a sequential type of discussion with turn-taking on one topic at a time. To what extent this is a consequence of the design of the forum

interface or typical of the sample (mostly unaccustomed to this mode) is not known. From the perspective of participants, the forum might be experienced as somewhat disjointed, and perhaps quite demanding concerning both form and content. However, there is little evidence of breakdowns, dissolution and disorder. Requests are as a rule met, except for the more expressive and affective statements. In the case of certain topics, e.g. chatting as in the above examples, utterances are linked and the pattern of connections shows coherence, references to previous postings, and a social network[125].

In general, issues in *The Tower*'s discussion forum echo issues that are salient in the survey's open-ended questions. This indicates that even if participants are not 'guided' by researcher-designed questions and topics, they are preoccupied with identical or similar questions. In the discussion forum, participants are occupied with general learning and teaching needs more than technological issues. But when such issues are raised, they are nearly always related to didactic and pedagogic concerns.

One of the postings in *The Tower'*s discussion forum illustrates the complexity described above. It was written in reply to two participants questioning the tenets of learner autonomy, a topic dealt with in module 5 in *The Tower*:

> Reply from: Knut, date: 19 November -99
>
> Subject: Topic 5: student autonomy
>
> (…)
> - the shift from the teacher-centered, linear, one-size-fits-all education of the past to the learner-centered, hypermedia, customized education envisioned by Reform '94 as well as the author behind the 17 points listed in Topic 5, amounts to a *revolution* or a *paradigm shift*
> - we, the teachers, have not been sufficiently prepared for our role in this revolution - instead, we have been showered with circulars from on high that presuppose that the *revolution* has been completed and that all is well
> - only sustained, well-funded in-service training, networking between teachers, and extensive experimentation can help us hammer out a new pedagogical practice over the years ahead
> (…)
> Two points that I think are worth considering for Tower members, are:
>
> 1) Do we need a new theory before we can implement a new practice? Speaking for myself, I know that books on pedagogical theories have been a ways down the list of favorite reading materials ... It is pretty obvious to me, though, that teachers need a meta-perspective on their role in the same way that students may benefit from meta-learning. In addition to the articles published on the Tower site, I have enjoyed some of the materials on *constructivism* to which Svein has several links on his website.
> Would you care to comment on constructivism and its possible relevance to this process, Svein?
>
> 2) To what extent can ICT help us transform visions into reality? - oh, yes, no posting to The Tower without an ICT angle ;-) ... Networking of students and teachers must necessarily affect the way we work in the future. If we haven't seen much of a change so far, my theory is that it is only because networking hasn't yet reached critical mass. I cannot foresee the exact shape of our cooperative efforts, but I hope and believe that in a few years' time we'll be looking back on today's teacher's role and say something like: `Do you remember how incredibly lonely it was to be a teacher, back in the 20th century ...?`

[125] For more on online exchanges and especially turn-taking, cf. Chapter 6.4.6.

> So, my short answer to Sofie and Helge as to how we can do the things indicated in the 17 points: gradually!

This response crystallizes many of the findings from *The Tower's* online forum. It embeds technology in an educational "paradigm shift" while suggesting the potential found in ICTs to be conducive to such a shift. Further, it points to the need for theoretical foundations, collaboration among teachers, networking and further in-service training, and it promotes innovative practices. The style is typical of a multilogue in addressing two previous contributors (Sofie and Helge), a third party (Svein) and all list members in a mixture of written and spoken style augmented by an emoticon ('smiley' signaling irony at the start of item 2) and emphatic punctuation. The initial posting resulted in five lengthy responses, including the one quoted, but the topic of learner autonomy resurfaced in other postings on e.g. plagiarism and new types of tasks to be designed.

The above analysis of interaction patterns in *The Tower*'s discussion forum raises the question of what kind of community *The Tower* is (not just the forum); what kind of practices emerge and can they be said to constitute a learning community? These issues will be addressed next.

5.8. The Tower as a discourse community

Lave and Wenger's (1991) seminal construct *community of practice* is highly relevant when asking what sort of community an in-service course like *The Tower* represents. The assumption is that communal activity is vital for in-service courses to increase teacher professionalism. Hence, we need to analyze the type of communal arrangement that characterizes *The Tower*.

Lave and Wenger exemplify communities of practice as co-located groups in informal settings where apprenticeship in crafts is a common denominator. Their anthropological approach centers on the situation in which learning takes place and how people involved in learning processes arrange themselves around such processes. The authors then ask what *kind* of social situations and arrangements that provide for learning to take place. Since learning is a way of acting in the social world, focus is on what kind of action. Their answer is the construct of *legitimate peripheral participation* (LPP): "By this we mean to draw attention to the point that learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community." (op.cit.:29). Activities and tasks are not only curricular but closely connected to the whole person and the system of relations s/he is part of. Only then can learners be apprenticed into becoming a full member of the community. But 'full membership' is also socially and historically determined and hence negotiated over time.

That learning is situated does not mean that it occurs as some independent process that happens to be located somewhere, but that "learning is an integral part of generative social practice in the lived-in world" (op.cit.:35) and where participants are centripetally moving towards greater mastery. Such forms of social practices are distributed among learners and teacher(s), resulting in change for both parties and thus blurring the teach/learn dichotomy. The authors state explicitly that, "Rather than a teacher/learner dyad, this points to a richly diverse field of essential actors and, with it, other forms of relationships of participation" (op.cit.:56), and, "To take a decentered view of master – apprentice relations leads to an understanding that mastery resides not in the master but in the organization of the community of practice of which the master is part".

However, when participants in *The Tower* form the community, we see different aspects than those emphasized by Lave and Wenger. Firstly, we move into a more formal 'school' setting where participants are not just enculturated into time-honored practices; they are in a process of working out new practices for which there may not be an established culture. Consequently, the process of legitimate peripheral participation seems too constraining[126]. Secondly, as a group they are distributed in their separate classrooms as well as in their online contexts, they occupy several dimensions of space. Admittedly, Lave and Wenger touch upon this possibility: "Nor does the term community imply necessarily co-presence, a well-defined, identifiable group, or socially visible boundaries" (op.cit.:98).

But whether the presence of interest groups going online can qualify as a community, is a different question. With its focus on participation, the community metaphor offers a view of learning and teaching where all parties are active and share responsibility. The innovative purpose, the dropout rate as well as the uneven level of participation and reciprocity in the discussion forum suggest that *The Tower* may not fall within the notion of Lave and Wenger's idea of a community of practice. That practices are partly formed online and partly in small groups or individually at schools also suggest that a different term may be more apt. Putnam and Borko (1999) discuss how the community of practice construct may not capture communities of teachers, preferring term *discourse communities* instead. The two authors point to "the lack of critical reflection in many teacher discourse communities" (op.cit.:11), and admit that "We know little, however, about the impact of these communities on experienced teachers' knowledge, beliefs, and practices" (op.cit.:10).

The construct of community has spawned several articles on its potential and constraints. Carol Linehan and John McCarthy (2001:129), while adopting the metaphor, find that it needs to be developed in order to embrace "the complex and often messy relations between individuals and between individuals and communities, which contribute to shaping the very social practices in which learning is situated in the models". They find that the metaphor too often is treated as an unproblematic construct, that it tends to overlook relations between the individual and the community, and that it is too vague regarding e.g. classroom settings: "the idea of students taking responsibility is not really helpful without considering what students are taking responsibility for and what the consequences may be in terms of student identity possibilities in the classroom" (op.cit.:132). This is a view that holds good for *The Tower* as well; relations are complex and the consequences for social and educational practices and teacher identities are not obvious.

When Linehan and McCarthy analyze primary school activities (mostly in an instructional mode) they resort to discourse analysis in order to examine how identities are formed as well as to examine how individuals manipulate what is going on. The discursive processes reveal "practices that may include scenes of conflict, shifting responsibility and control relations, and negative sanctions" (op.cit.:146). This complementarity between individual and collective, participation and relations involved are relevant to technology-rich learning communities like *The Tower*. As pointed out by Diane Hodges (1998), the emphasis on changing and developing identity as central to learning ('who are you becoming?') might

[126] Paavola et al. (2002) also criticize Lave and Wenger's construct of *Legitimate Peripheral Participation (LPP)* for having a too restricted view of learner roles. In a knowledge creating society, new generations of learners are not just enculturated and expected to carry on a tradition, but to surpass previous generations and develop new practices conducive to knowledge creation. To the present researcher, this seems a relevant point when analyzing what demands education for the 21st century places on teachers and learners.

create tensions with the more traditional, school-oriented epistemology of content-based knowledge construction of *what* is being learned. Another source of tension is the challenge to teachers' professionalism represented by ICTs; teachers may feel they have to reconstruct their notion of expertise. Such tensions materialize when we analyze sessions, episodes and events in technology-rich classrooms (cf Chapter 6).

While Linehan and McCarthy point to the compound and unresolved nature of the communities of practice construct, Diane Hodges (1998) examines a case of non-participation, as she experienced it in a teacher education curriculum. Hodges discovers "a split between a person's activities and their relations with participation, a rupture between what a person is actually doing, and how a person finds herself located in the 'community'" (op.cit.:272). This she applies to the community of practice model not always being able to account for "an individual's historical-cultural 'baggage'" (childhood experience, sexual orientation). Hodges does not experience the inclusiveness of peripheral legitimacy but a marginal and alienated position, "away from identifying as a teacher" and the dominating ideologies of the teacher community. Hodges points to how a community may include and marginalize at the same time, and how participants may raise questions of *difference* rather than *belonging*. These are pertinent observations when studying the teachers who participated in *The Tower* and how they appropriate – or failed to appropriate – ICTs.

In many ways, *The Tower* illustrates a movement from *place* to *space* and spatial practices, although in embryonic form. Space covers offline and online settings where people try to shape and reshape them according to their needs and intentions, but where these needs and intentions are also influenced by what such spaces afford. In the case of an Internet-based forum, "It is not just a set of individuals connected to other individuals, but an environment, a space, in which existing groups work and interact with each other, and in which other groups, with no initial awareness of themselves as groups, come to constitute themselves as such" (Burbules & Callister Jr, 2000:165). This type of space obviously shapes the way teachers think about their work and the way they practice, but it does not qualify as an instance of a community of practice in the Lave and Wenger sense.

In conclusion, it seems to be more important that participants in *The Tower* experienced an online space from within, *as part of their appropriation process*, than to what extent it can be defined as a community of practice or just a network, a relational space. As the present section suggests, terms such as participatory genre, multilogue and discourse community may be more relevant. Putnam and Borko (1999:8) observe that "when diverse groups of teachers with different types of knowledge and expertise come together in discourse communities, community members can draw upon and incorporate each other's expertise to create conversations and new insights into teaching and learning". *The Tower* as a discourse community situates, shapes, and constrains participants' learning experience of ICTs, it represents a particular context for professional development, just as the classroom represents another type of context and where insights from *The Tower* need to be recast according to features found in this particular context.

5.9. The Tower: a summary of the issues raised

Chapter 5.3 addressed three research issues; aspects related to participation or dropping out of *The Tower*, beliefs about and attitudes to ICTs in EFL as well as in society, and beliefs about and attitudes to the role of the teacher in ICT-rich environments. The rationale for exploring such issues was that they could serve as a backdrop of general concerns when examining the practices of individual teachers. The primary research object, teachers' appropriation of ICTs,

can thus be illustrated on more than one level or, as argued in Chapter 4.5.5: different refractions from the object are sought captured so as to add to the 'thickness' of description.

What the data collected from *The Tower* survey and online discussion forum express is summarized in the three sub-chapters that follow.

5.9.1. Issue 1: Participation

The majority of the teachers who make up *The Tower* sample are well-experienced and middle aged teachers. The findings indicate that teachers who completed the course as well as teachers who did not complete the course signed up for the same reasons; a wish to develop their teacher professionalism. Motivation for taking on this extra work is to be found in participants' desire to develop as teachers of EFL. With no rewards, few external stimuli and little weight attached to outside pressure, intrinsic motivation comes across as the major force[127]. Of course, with all the attention given to ICTs in and out of educational contexts teachers cannot remain unaffected as to the demands placed on us all, but *The Tower* sample of teachers illustrates the importance of in-service training to their profession so often expressed by teachers. External motivation, e.g. in the form of better opportunities on the labor market or fear of not being up to date, is not a distinct feature with *The Tower* sample. From the reasons they give, these teachers show a lot of devotion to their work. Also, they felt the course to be relevant for them.

As for completion, why Group A did complete seems to be associated with a collaborative mode of work and long teaching experience[128]. Teachers who did not complete attribute this fact to lack of time and lack of support. Lack of time is a common theme in other studies of innovative projects in Norway (Erstad & Frølich, 2002:13) and elsewhere (Egbert et al., 2002).

As ICTs constitute a fairly 'young' phenomenon in education, one might expect that young teachers would be more eager to participate in a course such as The Tower. However, this is not the case. The more experienced segments have a higher percentage of completion while the group who did not complete the course has more teachers in their 30s. Keeping the socio-economic factors associated with younger teachers aside (raising kids, housing) it might seem that ICTs in learning and teaching require confident teachers who can draw on a repertoire of approaches to, activities for, and ideas about language learning that are developed through many years of experience. Learning and teaching in ICT-intense environments are complex endeavors and it takes well-prepared teachers to negotiate this complexity. The time and effort that go into this probably cannot be underestimated.

An additional reason why Group A completed the course is found in the way they view the course content, i.e. the seven modules and the discussion group (question 11). When asked if they found the topics to be very relevant for them as a teacher of English, the percentage of replies is highest in the *partly agree* category for every topic. The ones that come highest in the *fully agree* category are *Information Retrieval* and *Communication and Publication*. However, there are not significant differences here, most of the topics scoring around 30% in

[127] Gobbo and Girardi (2001) find that intrinsic motivation is characteristic of constructivist oriented teachers who integrate ICTs.

[128] Similar findings are reported in a study of "exemplary computer-using teachers" (Becker, 1994). Their teaching environments was characterized by four features: existence of a social network, sustained use of computers for tasks that were not limited to the curriculum, organized support in the form of e.g. staff development, and acknowledgement for teachers who put down time and effort.

the *fully agree* category. Topics that also score in the *partly disagree* category are the *Discussion Forum* (28,6%) and *English for Special Purposes* (21,5%). Typical of the two are that they cater to either the more committed participants or participants in specialized fields. Still, it is worth noting that a relatively low score for the discussion forum suggests that *The Tower* never achieved status of a shared, virtual community of practitioners even if the *fully disagree* category is hardly represented.

The most significant difference between Group A and B is found with regard to collaborative or individual work methods. It seems as if intrinsic motivation must be supported and sustained by a sensible division of labor and a working environment conducive to appropriating ICTs for EFL. There may not be a causal relationship but the correlation between a collaborative work mode and completion of the course is so noticeable that the issue of collaboration among teachers is worth further research. Some quotes from teachers who dropped out may illustrate how they perceive constraints on collaboration (number of respondent in brackets):

- *I did not have time and space (or the schedule) to co-operate with the other teachers at my school taking the course (156)*
- *The administration of my school did not allow me to be absent from my teaching to participate in the course + gave no time at school (173)*
- *It was difficult to co-operate with collegues (sic) (180)*
- *I was not given any time at all from my headmistress to attend the course, and I found I would not spend my spare time under those circumstances (186)*
- *I was alone at my school taking this course (188)*
- *There was not sufficient support from other teacher colleagues who had signed up for the course at my school (203)*

Such sentiments are also voiced by participants who completed the course. The following two statements are from the open-ended section of the questionnaire and the final 'other comments' option (question 26):

- *The Tower did not work well in our area. It was as if decision makers at all levels did not give a d*#% (sic) about the Tower. You were completely on your own. Had to spend a lot of my spare time on this (92) (T)*
- *How lucky I am to be working at a school that has given high priority to computer facilities as well as to technical assistance! Quite a few of the Tower participants have so many problems – I feel sorry for them (62)*

To summarize, using the questions that guided the issue of participation:

- Group A and B sign up for the same reasons: to develop their professionalism
- Group B consists of teachers who say they
    - work mostly on their own
    - feel pressed for time
    - experience little support from school
    - consist of more teachers in their thirties than group A
- Group A completed the course because they had greater opportunities for collaboration and they were somewhat more experienced
- Except for collaboration and experience, there are no major differences between Groups A and B. However, they may be seen as two different cultures-of-use as Group A through collaboration and experience are better equipped to handle constraints of time and the

complexities involved in appropriating ICTs. These findings suggest that Group B did not complete the course for reasons found in their working environment and how these reasons primarily appear as constraints in the organizational framework. Available equipment, technical difficulties and disagreement with course profile or feeling of irrelevance, all score comparatively low. To Group B, it might seem as if ICTs were *not situated but planted,* without enough consideration of the conditions under which they were supposed to work

5.9.2. Issue 2: Beliefs about ICTs and EFL

The main characteristic of *The Tower* is how ICTs were introduced as an integral and integrated element in teacher development. Hence, the beliefs that emerge are influenced by the situation in which they were allowed to develop. To summarize, using the questions that guided the issue of beliefs about ICTs in EFL and in society:

- All the topics in *The Tower* course were found to be very much relevant
- Effects on participants are primarily associated with instrumental appropriation followed by a realization of new potential. The latter is especially salient in the discussion forum
- Effects of ICTs in EFL are primarily associated with learner motivation. Effects are also associated with extended or transformed practices
- The role of ICTs in society is also primarily associated with facilitating certain information handling procedures, but followed by views that frame ICTs as an extended learning environment for communication purposes
- In the EFL classroom ICTs are seen as bridging the gap between in-school and out-of-school practices

What these findings seem to indicate is that with regard to preparing teachers for technology intensive learning environments, education and training must capture the role of artifacts in the *total* learning environment. Decontextualized ICT skills are not enough.

Taken together the beliefs and attitudes to ICTs in EFL and in society seem to add up to a perspective dominated by *affordances*. Teachers who completed the course seem to associate ICTs with primarily learner motivation and possible innovative teaching practices, new types of tasks and exams and new relations between learners and teachers. Also, ICTs are often associated with extended learning environments, transcending the constraints of the physical, co-located classroom, and these characteristics open up for new practices and relations teachers associate with ICTs. Instrumental mastery of technology is regarded as an important, but insufficient prerequisite for teachers working in technology-rich learning environments. These beliefs are *future-oriented*; they address the potential uses of ICTs and not only the importance of mastering current technologies.

When such future-oriented perspectives are accompanied by a communicative approach to foreign language learning (89,4% of participants who completed), we may discern an emerging view of ICTs as bringing about *opportunities for language use*. This is further emphasized by the 40,4% that sees foreign language learning as primarily a result of participation in social interaction. Studies by Cuban (1986) and Becker (2000) show that teachers who integrate technologies in their practices hold a teaching philosophy (constructivist views) that differs from those who do not. The present study does not examine such possible correlations, but it is noteworthy that such a large majority in Group A adheres to a communicative approach and that so many see language learning as a result of participation.

Answers to the open-ended section of the survey and the postings in the discussion forum address mostly practice-oriented (but not necessarily technical) issues. In the open-ended section the most salient concerns are associated with didactics, particularly how participants have appropriated technologies to the extent that they can now use them for their own purposes and how this involves changes in learner and teacher roles. However, there are also indications of strong undercurrents pertaining to theoretical perspectives, organizational issues and educational policies. In the discussion forum theoretical concerns and broad educational issues are sometimes raised and articulated on an informed level, but by not more than 20 of the participants. Findings from the forum suggest that this is primarily a ground for teachers seeking and giving assistance on practicalities.

What emerges is a collective belief that instrumental mastery must be related to demands from a learning environment that extends the co-located classroom. With a view to teacher education and in-service training, this is important as it points towards dimensions beyond learning the instrumental skills required by the technology. Appropriation processes apply to the technologies involved as well as the spaces, environments, relations, and affordances they create.

5.9.3. Issue 3: Beliefs about teacher roles

The roles teachers see for themselves in ICT-rich environments are cultural constructions. That is not to say that roles are *determined* by changes in the learning environment but that they emerge as a result of the interplay between individuals and their interaction with their contexts; colleagues, learners, artifacts and school culture. To summarize, using the questions that guided the issue of beliefs about teacher roles and attitudes:

- The participants still feel their primary role is that of the subject authority, but several additional roles are considered important, e.g. as an evaluator of online resources and designer of learning situations. Being a catalyst, designer and in possession of critical literacy and inventiveness come out on top. To be a researcher on one's own practice also scores high. Less importance is attached to proficiency of merely technical aspects of ICTs although hardly any role is perceived as *not important*. The implication is that a more complex set of roles awaits teachers who enter into technology-rich learning environments
- The participants see an increase in the importance of professionalism and believe that they possess professional qualities that are important. These teachers seem to have emerged with increased self-confidence through the course. They rule out loss of identity and marginalization, but express some insecurity when working in an ICT-rich environment. When *Loss of control* emerges as one of the salient features of change (in the open-ended section), it should therefore not be interpreted as erosion of a teacher's position but that the situation in an ICT-rich setting is less predictable and controllable
- The participants express that online, 'virtual' extensions of the classrooms are very much compatible with the physical, co-located type. They also seem to find themselves at ease in working where these two types meet, i.e. at the interface. This is an important finding as it shows that new practices can be established if they are introduced in a situated perspective, closely related to the teacher's subject(s) and with a didactic rationale

As ICTs bridge offline and online environments as well as in-school and out-of-school practices the notion of didactics is transformed. This requires a reconfiguration of teacher professionalism, and it seems that teachers are prepared for such a reconfiguration given that

opportunities are situated in the teacher's professional space and related to her didactic concerns.

The survey does not result in a limited number of significant response categories. On the contrary, how respondents seem to find so many of the alternatives offered relevant points to the fact that ICTs do not fill a particular role, but that they infuse learning and teaching practices with a multitude of possibilities. The survey reveals that participants feel they have come to use and appropriate ICTs (including exchange of knowledge and opinion), at least in a conceptual and instrumental sense. Moreover, emerging technical mastery is accompanied by a realization of the importance of didactics when integrating ICTs in education. These concerns are echoed in the online discussion forum. As for the three research issues that drove the survey (cf Chapter 5.3), Table 5.16 (below) encapsulates the present researcher's interpretation of responses:

Table 5.16 Overview of findings

Questions	Answers
Why did Group A complete the course while group B did not?	While both groups were motivated by professional development, Group A exhibits more opportunities for collaboration and more experience as teachers. They completed the course because of its relevance and situated nature. Lack of time and support are stated as reasons for dropping out of the course.
What do the participants believe about ICTs and their role in EFL?	ICTs represent access to authentic material and communicative opportunities. This involves an extension of the learning environment that requires new designs for classroom activities and tasks. There are epistemological implications.
What do the participants believe about their roles as teachers in ICT-intense settings?	The participants see the teacher as becoming more important in ICT-rich settings and they are confident with such a role. As the learning environment is extended through online spaces the participants see their role at the interface of these dimensions. There are implications for how we configure interactions between learners, teachers, and technologies.

5.10. The Tower *- representativity*

As discussed in Chapters 4.5.3 and 5.8, *The Tower* is a context that partly shapes and is partly shaped by participant activity. As a phenomenon, and with a self-selected sample, it is unique and cannot be replicated with an identical set of variables. Nor can responses be treated as objective facts, but as elements of a particular discourse. Still, it is important to examine the sample of respondents and how representative they may be of teachers. The present study argues that despite lack of statistical generalization there is analytical generalization in the sense that "the findings from one study can be used as a guide to what might occur in another situation" (Kvale, 1996:233).

Firstly, *The Tower* sample exhibits demographic features that are representative of the Norwegian teacher population. However, the sample might exhibit a particular interest for

ICTs and/or value professional development more than the average teacher. Neither is it possible to overlook potential *Hawthorne effects*[129] or the air of novelty that might influence response. While this might weaken aspects of generalizability, it is important to stress that the purpose of the present study is not just to study *what is typical* but to examine *what may be*, what is likely to become more common practices (Schofield, 1993).

Secondly, how representative are responses for all the teachers who signed up for the course in the first place? For Group A the number of responses (107), a response rate of (61,5%) suggests that they are representative of those who completed the course. For Group B, however, non-response and attrition represent a threat to representativity and open up for the possibility of a systematic overstatement or understatement of beliefs. Also, while the sample number in both Group A and Group B is large enough to justify statistical processing, important socio-economic factors are not accounted for. Family situation (e.g. small kids to attend to), overtime, finances and educational level are but a few external factors that do not appear in the survey but that might have an impact on the results. It is possible hat the non-responsive sample is systematically different from the response sample in Group B, but this cannot be measured or investigated based on the existing data.

To what extent can *The Tower* sample be said to be representative of other teachers in terms of ICT proficiency? Were they already familiar with or even well versed in technologies when they signed up? This is an important issue since it may affect our reading of the results. There is no obvious answer, but a few facts remain: When Group A is asked if the course had little/no effect on them because they were already familiar with ICTs a mean score of only 4,53 suggests that this is a minor issue. Group B is not asked about this, but in their comments, three teachers state adequate skills in ICT as a reason for dropping out: "I already use ICT a lot in my teaching (I have done so since 1991)" (168). "I use ICT in class regularly anyway, and felt the course was not what I wanted most" (185). "I know the technology and I use ICT in classes. The course did not give me new input" (194). When Group A is asked about which course module participants found most relevant, *Information retrieval* receives the highest score, a typical 'beginner's topic'. This is supported by the category *ability to implement basic ICT skills* receiving the highest score when asked about effects of the course. In conclusion, as *The Tower* course commenced the sample of teachers who signed up seems fairly representative of teachers' familiarity with ICT.

Bias is especially relevant when using self-selected groups as in this study. This may not be a great threat to the trustworthiness of Group A since they represent a 'successful' sample (in terms of completing the course). Thus, they have little reason to respond to the survey for other purposes than the ones reflected in the questions asked. Group B, however, being 'unsuccessful' in completing the course may see an opportunity to justify their dropping out by e.g. placing emphasis on organizational issues or external factors in their working environment. Actually, that Group B feels the need to justify themselves is indicated by a number of remarks written in the margin of the questionnaire, and in the use of the *Other* category when asked for reasons for dropping out of the course. Consequently, when interpreting and discussing participation, justification and personal stakes become modifying factors regarding Group B. If only e.g. angry or self-righteous teachers in Group B returned the questionnaire, the results might be attributed to a variable not accounted for in the study.

[129] A *Hawthorne effect* is said to occur if attention from researcher or the feeling of being singled out influence informants' performance or response. However, when interventions are instigated (such as in the case of *The Tower*) it is, in fact, the Hawthorne effect that might bring about the intended change!

However, the explanations cover a wide area of reasons, indicating that there is no such single variable at play.

With these reservations, and while the statistics do not presume to be inferential, the responses could still be relevant to a larger population of teachers of EFL and perhaps of teachers in general who encounter ICT in their practices.

5.11. Conclusion

The Tower is a powerful environment, a discourse community, for shaping and constraining how teachers think about and appropriate ICTs. It is an *integrative* (Wenger, 1998:249) environment in the sense that it offers in-service training as a process of participation, places emphasis on learning and not just teaching, and gives participants access to resources by which they can reconfigure their own practices. Generating and sharing ideas about ICTs in EFL is at the heart of these resources.

The main findings from the survey and discussion forum indicate that teachers' encounters with technologies involve complex processes regarding appropriation of technological artifacts and realignment of teacher roles. In addition, implementing technology in the subject depends on developing a combination of instrumental mastery and didactic/pedagogic insights. These processes are demanding, but teachers seem to acknowledge and even embrace such challenges[130]. However, such processes must find support among peers, administrations, and decision makers if they are to be sustained beyond a course or project period. They must also be contextualized, situated in the teacher's subject specific and didactic practice.

The Tower formed the immediate cultural-historical environment that shaped the ideas and beliefs about ICTs of the participants. At the same time, *The Tower* is also shaped by the participants' contributions, questions and exchanges. Their conception of ICTs is, consequently, regarded as "a social construction, not an autonomous ideal" (Grossman et al., 1999). The question is not so much what is inside these heads but what their heads are inside of - in other words, to what extent they carry on a tradition of ICTs being "mere tools", a view traditionally found in policy papers and in-service courses. The survey points to a much more complex relationship between teachers, subject matter, and ICTs.

But even if teachers hold beliefs about ICTs as empowering learners, as having the power to transcend the classroom, bridge in-school and out-of-school practices, and challenge their professionalism this does not necessarily mean that their classroom practices change or suggest which direction change might take. How ideas, beliefs, ICT skills and approaches to ICTs, their *technoliteracy* (Lankshear et al., 2000), formed through participation in *The Tower* might carry over into classroom use is also part of the appropriation process. It is in their daily activities and classroom practices that teachers draw upon ideas, beliefs and skills fostered through participating in discourse communities dedicated to professional development. While participation in *The Tower* might have fostered instrumental and conceptual appropriation, only teachers' classroom practices can illustrate *cultural* appropriation. Teachers not only make their beliefs and approaches developed through participating in *The Tower* become visible in the classroom, they also reconfigure activities, interaction, and the organization of subject knowledge as they integrate ICTs in their work. For this reason the next chapter looks

[130] Similar findings are reported by Gobbo and Girardi (2001).

at how the ‘music score’ as captured by *The Tower* survey is operationalized in performances by three teachers who completed the course.

6. Classroom Encounters: teachers practicing in ICT-rich settings

(…) classrooms are complex, self-organising, adaptive systems: they have to arrange themselves around the interactions between their various human and non-human components.
(Lankshear et al., 2000:112)

6.1. Introduction

While Chapter 5 aims at eliciting teachers' attitudes to and beliefs about ICT as they are articulated through a survey and an online forum, this chapter takes a close look at three teachers of EFL (at two senior high schools; Mercator and Minerva) practicing in technology-rich environments. The focus is on how practices evolve, the *complexity* and *transformation* involved, and under what circumstances. It is an ethnographic[131] type of refraction from the methodological prism (cf Chapter 4.5.5); one that reflects *activity* as the center of teaching and learning in technology-infused settings. While *The Tower* survey aimed at eliciting articulated beliefs and attitudes from a sample of teachers who completed an extensive in-service training with ICTs and subject didactics, the present chapter takes an in-depth view of activities and experiences that might constitute such beliefs. Together, the survey and the ethnographies seek to capture several dimensions of the object of study; *how teachers appropriate ICTs* and thus enhance our understanding of how teaching and learning emerge in technology-rich settings.

The methodological approach to the phenomenon under observation is one of abduction (cf Chapter 4.5.6); a pattern that emerges from data is interpreted by the present researcher and sought illuminated from a theoretical position in order to lend support to the interpretation. Data are not just illustrations of theoretical constructs, nor are theoretical constructs a result of an inductive approach to data; abduction seeks to analyze a case or a symptom as an indication of an underlying pattern. Such a pattern consists of the researcher's perspectivized observations. To quote Alvesson and Sköldberg, it involves "a repeated process of commuting or alternating between (empiri-laden) theory and (theory-laden) empiri" (Alvesson & Sköldberg, 1994:47, my translation).

The data from the two schools are of different types. At Mercator the primary data are from classroom interactions. The analytical focus is on educational designs (cf Chapters 3.11 and 4.4.4); how these are orchestrated and enacted in the classroom including emerging roles of learners and teachers, the scripts they bring into the activities, and how transformed and new educational spaces may emerge in the ICT-rich classroom.

At Minerva, the primary data are from situations that capture aspects of how two teachers (with the help of learners and staff) jointly develop professionalism in the ICT-rich classroom. Consequently, there is a shift of focus from interactional patterns to community building, although designs form the point of departure in both cases. Compared to Mercator, data from Minerva are to a greater extent gleaned from informal interviews and random talks and exchanges (often during sessions) between teachers and the present researcher. Where educational designs and classroom interactions do not only echo practices at Mercator but are found to extend our understanding of ICT-infused practices, they are discussed with a view to the transformed classroom.

[131] The term *ethnography* is discussed in Chapter 4.2.2

The slightly different approaches to collecting data from the two sites serve two goals. Firstly, there is the wish to capture different refractions from the prismatic phenomenon (cf Chapter 4.5.5) of teachers' appropriation of ICTs. This is a methodological concern. Secondly, there is the wish to examine phenomena of transformation and appropriation at different levels and across different dimensions. Just as *The Tower* section aimed to capture primarily conceptual appropriation, the analyses of Mercator and Minerva aim to capture primarily cultural appropriation at classroom and collegiate levels respectively. In the latter case, peer interaction is examined as a way of organizing ICT-intensive designs, operationalizing collective zones of development, and build a community of inquiry (Wells & Claxton, 2002). This is a theoretical concern.

The aim of the present chapter, then, is to analyze this complexity of classroom activities so that current and future integration of ICTs are more informed by the ethnographic tenet of 'the way we do things around here' (Massey, 1998). This 'way' might just as well be considered to be *expertise* – a key construct that has briefly been touched upon in Chapter 3.9.6 on teachers' professional knowledge and which will be pursued in the conclusion of the present chapter.

While the three teachers observed in this study may have appropriated technologies differently, they share the fact that they place ICTs in the context of larger educational *designs*, i.e. their way of arranging human and technological resources so as to be conducive to EFL. But the view from the classroom is a multi-faceted one. No two classrooms are alike as they bring about and sustain ideas and practices that have developed within a particular classroom culture or, as in this case, this particular *information ecology* (cf Chapter 4.4.2) as found at two educational sites: Mercator and Minerva senior high schools. In addition, ICTs cannot be treated as 'one' technology, partly because the label is an umbrella term for a diversity of technologies, software and hardware, partly because these technologies are subject to change when they are appropriated in different settings. While technological detail is not focused in this study, it nevertheless attempts at avoiding a 'black box' view of technologies in which components are not unpacked or recognized (Orlikowski & Iacono, 2001, see also Chapter 3.7).

At first glance, Mercator and Minerva might seem similar. They represent the same type of a commonly found Norwegian Senior High School with a combination of general and vocational subjects, they are located in the same region and their learners would have similar socio-economic backgrounds. However, their histories regarding implementation of ICTs are different. Mercator and Minerva differ with respect to technological history and the way ICTs are approached individually or collaboratively. But while they differ in some respects, they share the overall purpose in exploring and exploiting technologies to benefit learners in their efforts to learn English and prepare them for a world where multiliteracy is a key competence. These efforts constitute the episodes studied in the present chapter. The terminology used for time elements are as follows:

- **Session:** a (mostly) 45 minute class with a break on either side
- **Episode:** a sustained activity with a particular type of interaction and/or participation until another type replaces it (cf unit of analysis in Chapter 4.7.2)
- **Sequence:** a series of exchanges, particular instances, or actions that make up an episode
- **Instance:** a particular exchange, occurrence or action

But while sessions, episodes, sequences, and instances may represent significant activities, they are all comparatively short moments of time, adding up to the more longitudinal aspects of education; the project, the course, the term. And while episodes may be relatively short, they are again made up of moments, fractions of seconds that may carry immense importance in themselves. In short, *time* is of essence when turning to classroom ethnography. A note needs to be made on how this most elusive of dimensions constrains the analysis[132].

6.2. Time, space and ethnography

Representing life in classrooms in print may seem like an impossible endeavor. The scales of time and space are so many that a researcher is forced to make brutal decisions as to which cuts and slices to analyze, always being aware of the dangers of reductionism. Based on extensive classroom research, Neil Mercer observes:

> *Even if I visit participants over some days or weeks (which, in my own research, is what I try to do) I know that they have a communicative history and future, of which I can only ever see traces in the continuous present that I share with them. It is to remind us of such things that we need to take a historical, social and cultural perspective on the guided construction of knowledge (Mercer, 1995:61).*

With regard to time and space, from a sociocultural perspective learning is not seen as just moments of successful processing. It is not restricted to 'mentalistic' constructs like schemata or to particular 'educational sites' like school. James P. Gee et al. summarize the sociocultural approach in the following way:

> *In a sociocultural approach, the focus of learning, and education is not children, nor schools, but human lives seen as* trajectories *through multiple social practices and in various social institutions. If learning is to be efficacious, then what a child or adult does* now *as a learner must be connected in meaningful and motivating ways with 'mature' (insider) versions of related social practices (Gee et al., 1996:4, emphasis in original).*

Consequently, a sociocultural perspective on learning does not separate in-school and out-of school practices but sees the two as mutually constitutive. Also, events along one trajectory but widely separated in time and space may be closely related in nature, bringing forth patterns that may escape a researcher constrained by a different spatio-temporal scale: s/he cannot observe everyone all the time. It is therefore necessary to determine the topology of the information ecology under scrutiny so that the segments presented can be related to a larger whole.

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[132] Other qualitative researchers of ICTs in classrooms have touched upon issues of time, but have rarely stopped to debate them. See e.g. *Internet Communication in Six Classrooms: Conversations Across Time, Space and Culture* (Garner & Gillingham, 1996), *Electronic Literacies. Language, Culture and Power in Online Education* (Warschauer, 1999), and *Teachers and technoliteracy: managing literacy, technology and learning in schools* (Lankshear et al., 2000). The first book discusses emergent patterns over time, the second compares how digital technologies are used for very different purposes according to the sociocultural history of four educational sites, and the third addresses temporal as well as comparative issues from a sociocultural perspective:

> *We wanted to 'capture' and describe a range of illuminating instances of practice using new technologies in literacy education: looking for telling cases, so to speak. In most cases, data were collected over just three or four days. These data included contextual or background information; artifacts (for example, policy documents and statements, lists of technology resources, descriptions of student work); audiotapes and transcripts of interviews; and describing illustrative instances of practice – particular events or episodes that were likely to be similar to other events and episodes, both at that site and others (Lankshear et al., 2000:4).*

In his article titled *Across the Scales of Time: Artifacts, Activities, and Meanings in Ecosocial Systems* Jay L. Lemke (2000) addresses such issues by asking questions like how moments add up to lives and how our shared moments together add up to social lives. Lemke argues that what is needed is a dynamical view in which processes are the unit of analysis: "In a dynamical theory, an Ecosocial system is a system of interdependent processes; an Ecosocial or sociotechnical network is described by saying what's going on, who's participating and how, and how one going-on is interdependent with another" (op.cit.:275).

Lemke's *ecosocial system* is in many respects similar to the *information ecology* metaphor used in the present study. In both cases, processes and activities are essential when studying what goes on. The question is in what ways a current event (N=1) is linked to past events (N-1) and future events (N+1). In the words of Lemke:

> *What is possible on the focal scale, the kinds of interaction that can happen, depends on the kinds of processes and participants at the level immediately below, level N-1. Processes at level N-1 are constitutive of processes at level N; they provide the affordances for activity of level N. But level N is never the top level (certainly for human social processes); interactions on the focal level are not free to range over all the possibilities afforded to them: they are also constrained by being themselves part of longer timescale processes at level N=1. The longer-scale processes determine what is probable at the focal level (op.cit.:277).*

This principle of *interdependence* is important when analyzing episodes that constitute educational practices. An episode, however rich, significant and representative it may be, is always part of a longer process of emerging practices. That is why the following analysis will adopt a horizontal perspective for more longitudinal timescales as well as the more vertical, in-depth examination of shorter cuts. For example, hardware, software, and networks have been developed over time, with specific intentions, with accumulated knowledge. The learner or teacher may in a brief moment or during a short-term event use such artifacts in a significant or even innovative way that points ahead. These timescales interact, and this is important to realize when doing classroom ethnography, even if capturing all the multiple timescales involved – especially the very short and the very long – is impossible.

Of particular importance is the principle of *heterochrony,* "in which a long-timescale process produces an effect in a much shorter timescale activity. This is a very common phenomenon in human activity" (op.cit.:280). These effects come about because of artifacts and their materialized forms of human interaction. Artifacts link human actions across time. In classrooms, these are found in the forms of textbooks, workbooks, notes, exam papers, and various technologies. All these are part of long-term timescales. But so is the sociopolitical discourse that makes up the world of the classroom, and also the shape of the room, its architectural place within the institution, its embodiment of a particular view of education and learning.

Under such conditions learners, teachers, and artifacts interact. Sometimes, a pattern may evolve, sometimes there is a serendipitous moment, sometimes an unforeseen breakdown. Such events are closely linked to the multiple timescales they belong to. The consequence for the present study is that there is no attempt at counting episodes that share particular characteristics and make up categories. Rather, a certain point on the timescale is highlighted because it illuminates certain practices, even if it occurred only once. As Lemke (2000:288) argues, it may be connected with a social practice which may be spatio-temporally remote, but which adds up to the social aspects of life. As the present researcher falls short of living

up to Lemke's tenet that "It takes a village to study a village", such links cannot be proved; only hypothesized based on the significance attached to the event[133].

Other researchers have also approached issues of the longitudinal versus the moment-to-moment aspects of social practice:

> *Thus, by integrating micro and macro analyses of learning environments, we are able to investigate the social, spatial, and temporal organizational dimensions of literacy learning practices, that is, diachronic and synchronic dimensions of activity (Gutiérrez & Stone, 2000:152).*

In the study of Mercator and Minerva, three timescales are employed (cf Figure 6.1 below). Firstly, there is the longitudinal chronology of the sessions (level 1) that makes up the periods of observation; secondly, there are the episodes (level 2) that add up to sessions; thirdly, there are elements of classroom discourse that represent significant moments or sequences within episodes in the form of utterances or actions (level 3). The focus is on the *episode* as the unit of analysis (cf Chapter 4.7.2), although it will be embedded in – and embeds other – timescales.

In addition to the chronology, heterochrony, and time units from micro to macro level, there are synchronous *layers* at work. One layer (a) is what is observable to the teacher, usually her/his own interactions with learners. A second layer (b) which will be discussed is learner interaction, where learners engage in reciprocal assistance, often outside the teacher's focus. A third layer (c) is learners' interaction with technologies, only sometimes observed by the teacher. In sum, the analysis of the social practices in the EFL classroom also targets some of the moment-to-moment construction of these practices. Figure 6.1 (below) seeks to capture the multiple timescales and layers that interact; the social, cultural, and historical dimensions that embody an activity.

[133] In a study of computer-assisted classroom discussion (CACD) with French as the foreign language, Stephen L. Thorne addresses the question of ICT use on more than one space/time scale: "The following discussion examines in-lab CACD through the words of participants, with an emphasis on understanding CACD as it relates to their use of internet communication tools in *other contexts*, and how CACD is related to their *histories* with internet communication technologies" (Thorne, 2000a:6, emphasis added).

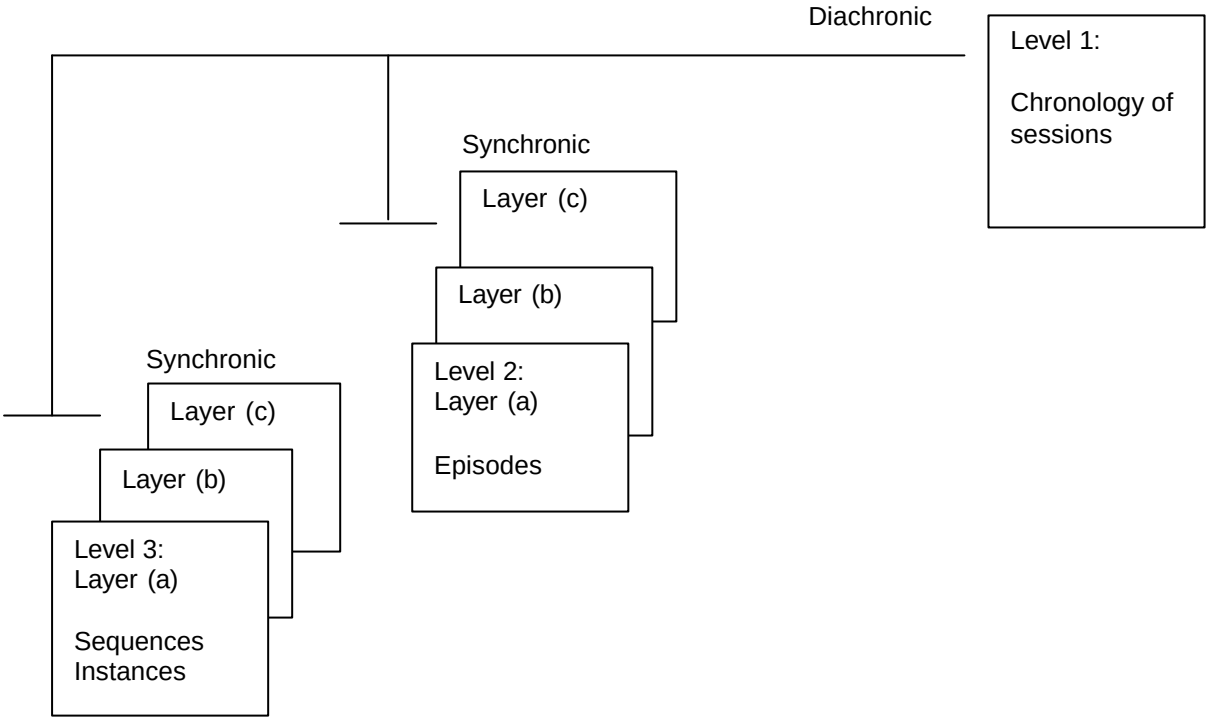


Figure 6.1 Timescales, levels, and layers in classroom ethnography. Vertical lines indicate timeslots of various durations, i.e. sequences make up episodes that make up sessions that make up a course. Layer (a) refers to interactions between learner(s) and teacher, layer (b) refers to learner – learner interaction, and layer (c) refers to learner – technology interactions. The horizontal, diachronic line denotes the general chronology.

Where sessions, episodes, instances, and various layers are discussed in the text these will be connected with their graphical location in the above figure and referred to as e.g. 2b (an episode involving learner – learner interaction). For instance, tables 6.2 and 6.3 in Chapter 6.4.1 refer to a series of level 2 episodes. The aim is to facilitate the reader's understanding of what timescales are involved[134]. In other words, it is a way to localize an analysis. These will then be subsumed under a broader theoretical perspective.

As will be seen from the observations and data from the two sites, the three timescales are not applied equally. At Mercator, the primary concern is to capture in-depth dimensions of transformation and appropriation. The seeds are found in diverse types of interactions and, consequently, the focus is on the synchronicity of such interactions. Longitudinal aspects are of secondary concern at Mercator. At Minerva, however, the diachronic dimensions are of primary interest. Interactions are still highly relevant, but here they are related to how participants struggle to develop a community and how one of the teachers (Marie) gradually comes to appropriate ICTs within this community. Together, the timescales employed seek to emphasize the 'vertical', in-depth- as well as the 'horizontal', over-time-dimensions of ICT integration.

But some scales remain out of reach for a researcher. It is necessary to realize that all involved parties come with their different sets of timescales as part of their historically and culturally formed identities. Learners and teachers enter the classroom with different histories

[134] Anyone who has been teaching within a format of a school day consisting of 45 minute slots with assigned subjects knows that time is an extremely powerful organizing factor. Activities must always fit the available slot. Hence this slightly obsessive attempt at visualizing this sociocultural constraint.

of events that have a bearing upon their activities in the present, they embody different 'cultures-of-use' (Thorne, 2002a). Moreover, the complexity of life in classrooms also makes it evident that what is being reported, including a sense of time and place, is sifted: "The kinds of data we seek to collect are usually the ones that seem important from where we sit within the system. It is highly unlikely that any social system looks the same from the viewpoint of all the component groups or roles within it" (Lemke, 2000:288, also cf Chapter 7.4 on validation).

While doing ethnography in classrooms is a complex endeavor, the complexity increases even more when activities take place in a social space that is partly offline, partly online. The notion of 'place' changes; activities are no longer geographically located to a classroom or school, but located in the relations between participants and artifacts. While this was discussed to some extent in Chapter 5.7 in relation to the participatory genre, it is important to dwell on a different aspect of activities in what is often referred to as 'Cyberspace'. Discussing ethnography across online and offline spaces, Kevin Leander and Kelly Johnson (2002) review research on offline and online practices and find that,

> *The key issue is that participants weave these social spaces and relations into their lives in such a way that the online is experienced as real and 'common-place', and that transitions between online and offline social spaces and identities may be less marked than researchers initially assume (op.cit.:7).*

In this way, online and offline spaces are mutually constitutive and dynamically co-constructed. 'Cyberspace' and other Internet-related terms and metaphors denoting a separate world maintain a dichotomy that does not seem to capture the basically intertwined relations between offline and online spaces. Mark Warschauer makes this explicit in proclaiming 'the death of Cyberspace':

> *I would contend, in contrast, that the significance of online communication lies not in its separation from the real world, but rather in how it is impacting nearly every single aspect of the real world. Just like there is no such thing as "speechspace" or "writingspace" or "printspace," so there is no cyberspace. The notion of cyberspace is thus not helpful for understanding the very real impact of online networking on our lives, and indeed the concept of cyberspace is slowly dying out (Warschauer, 2000a:1).*

When studying teachers and learners at the interface of the two spaces, a form of commuting is evident as they seamlessly move between the one and the other[135]. The dichotomy is replaced by an information ecology perspective that does not separate the two spaces, but sees them as dimensions of place and time. However, what the online dimension brings to the space and time dimensions is a sense of compression, events distributed in space and time can be experienced as an instance of 'here, now'.

With this excursion into temporal and spatial dimensions of education it is time to scrutinize the terrain as it appears in the form of two schools.

[135] Cf Figure 5.3 in Chapter 5.5.2 and how teachers position themselves at the interface of offline and online spaces.

6.3. Mercator Upper Secondary School

6.3.1. A history with technology

Mercator Upper Secondary School is, by Norwegian standards, a medium-sized school with its approximately 400 learners and 60 employees. Teaching staff at the time of the study consisted of ca. 50% of each gender and the average age was slightly above 50. The school is located close to the city center of an industrial/administrative town of approximately 60.000 inhabitants. From the 60s, the school offered a vocationally oriented area of study consisting of accounting, economics and subjects related to the field of business, trade and office. In 1980, it was formally established under its present name and with a combination of general and vocational subjects offered. Since then, the vocational branch has changed quite a lot, and at the time of observation plays a minor role compared to the general area of study.

However, the school's long history with computers is closely linked to the vocational areas of study. In 1968, the school acquired its first computer at the initiative of a foresighted principal. This purchase was an IBM 1130 punched card machine, leading to one of the teachers, later an inspector of studies and ICTs enthusiast, in 1972 succeeding in opening a new experimental form within the vocational branch with Electronic Data Processing (EDP). The learners who entered this particular form constituted in many ways a sub-culture or avant-garde within the school ecology, for some years keeping house in a separate, patrician wooden building with a notable bohemian atmosphere. The experimental form proved successful and was a major factor in establishing EDP as a national area of study, still connected to vocational studies but in the form of a study of computer technology as such and in particular programming and systems design. New mainframes and workstations, clients, replaced the initial IBM until 1984 when the PC was introduced.

1984 marked the beginning of a national effort, the departmentally initiated "Data Technology in Schools" project, to integrate personal computers in several subjects. This represents a shift in focus from technology for technology's sake towards a technology-as-tool approach. As one of only four schools chosen for the project from the beginning, Mercator stayed true to its vocational and commercial profile and concentrated on exploiting and exploring commercial software for educational purposes. This was somewhat contrary to current policies that placed more emphasis on developing pedagogical software from scratch. A group of teachers formed a project team to implement what was now gradually referred to as IT (Information Technology) in economics and language subjects. Considering the history and use of technology at Mercator, the inclusion of language subjects might seem somewhat surprising. However, this came about as a result of the inspector of studies promoting the communicative potential in the technology as well as the pragmatic approach of taking what was already commercially developed, e.g. word processors, and exploiting it for pedagogic purposes.

By 1989, Mercator was appointed 'National Resource School for EDP'. A handful of teachers were involved with research and development, doing in-service training for other schools and regions, and spending quite some time and effort on keeping up with a rapidly growing and changing field. Thus, the situation from the esoteric circle in the bohemian building was echoed in the form of a project group that was very much dedicated but never managed to make technology the property of the total staff of teachers. Some animals remained more equal than others. This made the information ecology at Mercator vulnerable. While the project group introduced technology through which their own practices could be transformed, this never took root in the ecology as a whole, hence making a key species susceptible to forming a subculture or a niche in the environment. Thus, from the very beginning,

technology at Mercator was characterized by two main features; the individual enthusiast as a driving force and (perhaps as a result) the separation of the technology-related efforts and projects from the school's mainstream activities. Possible relevance for one's practice was outweighed by time and effort spent on technicalities. The result was a peaceful co-existence of a handful of teachers who stuck with the technology and slowly developed new practices, and the majority who in ICTs saw little or no relevance for their own work There was lack of a critical middle ground, one was either computer-savvy (or 'saved'; there was ample religious metaphor around the project group) or not. And when trying to foster more computer familiarity, this invariably took the form of skills-oriented courses in computer use and not courses where pedagogic implications for learning and teaching were targeted.

Under such circumstances, enthusiasm might wither and activity might reach an impasse. During the 90s, the key species in the information ecology experienced burnout or kept a 'private' ICT practice going. Nevertheless, the school has since the 70s been identified with new technologies due to its participation in several projects. When invitation to participate in *The Tower* went out in 1998, the school's six teachers of English all signed up. Three completed the course; among them was Tom who in many ways embodies the computer-savvy culture at Mercator, a case of *heterochrony*, to stay with Lemke (2000).

6.3.2. Teacher: Tom

To characterize a teacher is a precarious venture. Not many people enter their occupations with such personal investment, not many occupations rely so much on the personality of the employee. Without speculating about Tom's personal qualities, however, it is important to point to some traits and hallmarks in order to better understand what unfolds during activities and episodes in his classes.

With his 36 years, Tom is well below the average age (51) of the teachers who took part in *The Tower* in-service course. Graduating from College with degrees in History, Norwegian, and English he has since moved into teaching media, an increasingly popular subject with learners. Regarding technological know-how, Tom is mostly self-taught, but has over the years acquired quite impressive insights in the more technological aspects of operative systems and computer networks. Regarding teaching and learning philosophies, he is eclectic, going for 'what works', but very often with a distinct creative flavor. Activities, variation, and creativity seem to be key ingredients in Tom's practice. He is also willing to take risks and face the outcome whether successful or not. As for authority, Tom is very much on terms with his class and seems to enjoy some respect through his finely tuned mix of self-irony and direct, unambiguous talk. In some of the episodes, what may appear as disruptions and impudence would rather illustrate the special and quite personal rapport between Tom and class 1aac. Neil Mercer makes a similar point of such phenomena, observing that "Such things may be hard to research, but they provide the interpersonal, emotional basis for the guided construction of knowledge" (Mercer, 1995:52).

The sessions captured during the spring term of 2001 were planned by Tom as to content, goals, and competencies sought fostered in learners, but never in great detail. Also, Tom runs his own website which is an integrated part of his designs for learning. At this website, learners find assignments, schedules, resources, and a door to the online extension in form of *NiceNet*, an online representation or extension of the classroom. A numbered overview of the designs (cf discussion of designs in Chapter 3.11) launched by Tom in sessions observed and recorded by the present researcher is illustrated in table 6.1 below. Together these designs make up the chronology of the horizontal axis in figure 6.1 (above) and form the basis of the

transcribed material from Tom’s class 1aac. Within these designs, some episodes and sequences will be analyzed in more detail.

Table 6.1 Overview of designs during period of observation
Topics are listed in chronological order (spring term 2001). One row equals one unit of up to three sessions á 45 minutes. Where one unit consists of more than one design, they are numbered a, b etc. Some designs span more than one session, e.g. no. 1 Creative writing; some more than one unit, e.g. the Martin Luther King activity spans 2b and 3a (the following week) and conferencing on NiceNet spans several units.

Topic	Instructions	Technologies	Comment
1. Creative writing	Setting: LA. Confrontation between environmentalists and motorists: "You are in one of the cars, on your way to an important event. Write down your feelings and thoughts"	a. Offline: PCs, word processor with spell checker and bilingual dictionary (applies to all designs unless otherwise noted) b. Online: as above plus Internet and NiceNet	Ad lib design as planned conferencing in NiceNet virtual classroom failed due to network error in the first session A spin-off effect materialized in a subsequent video-taped role play
2a. Conferencing	Post replies to initial message and continue discussion	Internet, NiceNet	A series of conferences to choose from, opportunity to create new ones. 'Haifaiv' provocateur makes a presence. The King text addresses new literacies
2b. (Re-) Writing: Martin Luther King factual text	Make it persuasive, use existing information on the net	Teacher's website	
3a. Martin Luther King factual text (ctd.)	200 words, only relevant information	Teacher's website for all three topics, Internet	Tasks a and b challenge traditional genres as they implement pre-existing information on the net, adds elements of hypertextual reading and manipulating text
3b. Tourist information brochure	Make it persuasive, use existing information on the net		
3c. Quiz (optional)			
4a. Text analysis: structure	Example of how to capture a profile	PC, projector, large screen ('interactive whiteboard'). Internet, teacher's website, additional websites. Laser pointer, NiceNet	Exploits colored text and laser pointer to highlight text features and point to cursor-sensitive links. Opens up for false leads in the conference to test learners' alertness
4b. Competition	Test your cultural and geographical knowledge		
4c. Conference on typically UK/US			
5a. Authentic listening from the web (on CVs)	Write answers to questions raised on sound files	Multimedia PC, projector, large screen ('interactive whiteboard'). Internet, teacher's website, additional websites. WinAmp, MP3 files	Proxy error disrupts item a, teacher must ad lib into b.
5b. Discussion on news, 'Big Brother', cartoons and popular music	In the form of a contest		
5c. Writing a job application and a CV	Curriculum goal: formal texts		Model texts and guidance on teacher's website

6a. Storyboard: Relationships. 6b. Quiz: Relationships 6c. Conferencing: Relationships	Develop story as from scene five Contest How to address classmates privately and in plenary mode	PC and projector, large screen, teacher's word processed handouts Internet, NiceNet	Topic an extension of earlier sessions 'Haifaiv' provocateur makes a presence
7. Term test preparation	Strategies for managing new style tests and exams	Teacher's website, Internet, class message board	Possibility of joining fellow learners on message board as part of preparation
8. South Africa exchange project	(planning stage)	Ensemble, email central	Plans partnership with colleague who has been to South Africa

Tom is able to change plans on the spot, and *ad lib* when necessary, often as response to input from learners. Enthusiasm and optimism characterize his approach to ICTs, but he is very much aware of when and where they have a place. These are probably some of the reasons he has been part of a group working at national level in order to design new-style exams[136] in English where ICTs are integrated. Tom's class, 1aac, is one of the handful of classes that might be subject to such a new-style exam at the end of the course. Consequently, Tom's work in the classroom is linked to emergent educational policies and exam practices. This makes Tom a particularly interesting teacher to observe, since his work has consequences for the future and since it is to some extent regulated by the policy dimension: his way of integrating ICTs in class could be feasible on a much larger scale.

At Mercator, Tom is on the whole working individually on his designs for ICT integration, there is hardly any 'community of teachers' regarding ICTs in EFL. However, his pragmatic approach also makes him a favorite target for colleagues wanting help, answers and advice. Still, this aspect of professional knowledge would need a theoretical framework in order to be made more robust and visible and thus reach beyond his immediate working environment. Tom's appropriation of ICTs is in many ways a cultural appropriation, although a fully conceptual appropriation may not always be expressed.

Tom was chosen in order to shed light on not only *what is* but *what may be* (future trends) and *what could be* (Schofield, 1993, cf Chapter 7.4), i.e. his practices illustrate opportunities that other teachers might pursue. Also, he clearly falls within the category of "expert" as discussed in Meskill et al.'s study (2002) of expert and novice teachers and their conceptualization of technologies: Meskill et al. show that expert teachers' conceptualization is characterized by viewing learners as locus of learning (novices: technology), learners as the focus (novices: their own role), empowering learners (novices: managing learners), and emphasis on learning processes (novices: product). In sum, experts' ability to recognize and create opportunities,

[136] The new-style exams referred to have been developed by the *National Board of Education* over a project period of several years, but have still to find a definite form. But variations have circled round the key idea that learners work collaboratively for some time on a particular topic with all available materials until they have to individually produce an exam paper in response to more specific tasks. The goal is to make room for an exam type where more competencies are tested, like the ability to benefit from collaboration and from use of tools. (Cf discussion of the role of the subject in Chapter 6.7).

including risk-taking, is a most salient feature that separates them from the novices. "Understanding conceptual differences and how these translate into such practical, procedural risk-taking may help further professional development efforts for technology-using language educators" (op.cit.:54). To find out how such conceptual underpinnings are enacted in complex, ICT-rich environments is the rationale for studying Tom (and later Helen and Marie) in the present study.

6.3.3. Learners: 1aac

Class 1aac is at the foundation course level in the Norwegian Senior High School system, which consists of three years of schooling before learners graduate. This would place the age of the learners at 16-17. English at the foundation course level is a mandatory subject, and there is the possibility of being selected for a – in this case – new-style exam with ICTs at the end of the course.

There are 29 learners in this class; approximately 50% girls and boys, two of them (one girl, one boy) are immigrants. Their 5 x 45 minutes of English per week have been grouped so that they have one double session and one triple session. This arrangement has been requested by Tom in order to accommodate for more extensive assignments, more coherent learning and also the use of ICTs which is arguably incompatible with the traditional 45-minute session. 1aac usually occupy a data lab for the triple session and a traditional classroom for the double session. In addition, they frequently use an auditorium for activities that require multimedia equipment. As this class also participates in the new-style exam project in other subjects (Economics), it means that they are heavily exposed to working with technologies and do not identify ICTs with one subject in particular. It also means that on certain days, they risk spending up to five sessions in the computer labs, which some of them feel is too much.

At the time (Jan 16, 2001) the researcher enters the information ecology of 1aac and Tom and their various settings, they have been together half a year as a class. This means that the learners know each other well, have had time to form alliances, test the limits of what is acceptable and not, and seem to express some sort of natural ownership as to the various goings-on. They cultivate the art of the snide remark, but without malice. When challenged by Tom to discuss in English, they are often reticent, or even trying to get away with a Norwegian phrase as part of their *counterscript* (cf. Chapter 5.4.7). When dealing with written assignments, however, they are very much on task. During the period of observation, Jan 16 to April 18 2001, no unpleasant or tense situation arose.

6.3.4. Artifacts: rooms, materials, ICTs

Rooms, architecture, and deployment of technologies carry discourses and they mediate certain practices. 1aac occupy their own turf in the form of a traditional classroom: in one of several rooms on either side of a corridor (the "egg carton" lay-out), 29 desks face the teacher's desk, which is at the same level. Metaphors of transfer, delivery of curriculum, and individual processing go well with this lay-out. However, desks are light and can easily be moved into pairs or small clusters. There are the basic educational artifacts of 'chalk'n board', maps, and pointer as well as some notice boards with fire instructions etc. This is where the textbook and the workbook reign. Tom makes use of this room to work on topics, texts, skills, and assignments that are central to the curriculum. There is no Internet connection or computer access from here. The room is bare, but light and friendly.

The computer lab mirrors a somewhat restricted man-machine relationship. There are two adjoining computer rooms, 15 computers in each facing the wall, one learner facing her/his

screen. In the middle of the rooms there is a large table around which to bring work to discuss or work on, a potentially collaborative affordance amid the individual pairing of learners and computers. Double doors separate the rooms, they are kept open during lessons, but this makes it hard for Tom to get everyone's attention at the same time. Learners must rise and move in order to consult others, except neighbors who can lean over or slide on wheeled chairs to work together easily. On the wall is a poster with the inscription:

Success is hard work and patience – keep going!! ?

Patience is, indeed, needed; the PCs struggle with multi-tasking, the local network is stable but the Internet connection slow and prone to breakdowns (it was upgraded from ISDN to ADSL the following term). Learners are allotted space on the school's server, and use the local network to save their files as they work on texts. During the English sessions, the main tools are word processing software (Microsoft WORD), an electronic Norwegian-English-Norwegian bilingual dictionary (WordFinder), and an Internet browser (Explorer or Netscape by choice). Some will make use of an HTML editor to make web pages or graphics programs. Of special interest is the *NiceNet* facility; a virtual classroom that can be accessed by all who receive an electronic key. *NiceNet* is used throughout the time of observation for a variety of purposes and provides an online extension of the physical, co-located classroom.[137] It offers a series of managerial and interactional opportunities; link sharing, uploading learners' texts, internal messaging service, and conferencing. The latter, extensively used by this class, is basically asynchronous but can approach synchronous qualities when the web page is frequently reloaded.

The auditorium, a recent acquisition, mirrors ideas in instructional design. It is a well-equipped room seating two classes (60 people) in gradually sloping bench rows facing a lectern. The teacher can operate a series of multimedia technologies including projecting computer and video graphics on a large screen. However, it takes time to understand which switches direct which processes. There is greater distance between teacher and learners in this room than in any of the other two. Tom is enthusiastic about this setting since it affords him a rich repertoire of teaching facilities.

This is but a brief sketch of an information ecology and its key species, but one which should indicate some of the affordances and constraints at play. Episodes are not necessarily analyzed consecutively in the order they appeared over the term. As Lemke (2000) reminds us: Shared moments far apart in time add up to social lives and particular practices. Where these are grouped under a particular label (e.g. different teacher roles) they should not be seen as purely descriptive categories but perhaps more as analytical categories that address certain processes that may have emerged over time.

6.4. Orchestrating Artifacts: Affordances and Constraints

6.4.1. Topic: relationships

The present chapter looks at two out of three consecutive sessions (3 x 45 minutes, - *session three was not recorded*) and the episodes and sequences that constitute them. These episodes and sequences correspond to unit 6 in Table 6.1 (above) with its three designs (a, b, and c) framing the topic of relationships. The first session consists of five episodes (cf Figure 6.1)

[137] In the spring of 2002 the school bought into one of the many commercial platforms serving as virtual learning environments and grouped under the umbrella term of *Learning Management Systems* (LMS), *ClassFronter*. This can be interpreted as a sustained result of all the work that centered around the somewhat less sophisticated *NiceNet*. At the time of writing, LMSs are becoming standard in most Norwegian senior high schools.

that do not make use of ICTs. A breakdown of the episodes that constitute the first session results in the following table:

Table 6.2 Overview of episodes[138] in session 1 (March 06)

Episode	Duration	Core Activity
1	0.40	Introductory small talk
2	8:15	Building a scenario: The conflict and the scenes that constitute a storyboard
3	13:40	Extended conversation, introducing more elements to the storyboard
4	7:06	Ironic introduction to and work with a questionnaire related to the storyboard
5	10:00	Going through learners' answers. Discussion
6	3:30	Instructions as to how to continue the story

The episodes link to previous sessions but (as it turns out) they also point to the next sessions involving ICTs that Tom has planned. As such, they illustrate the 'grander design' Tom is trying to put into action. The theme stays while the approach varies, all the time aiming to entice learners into participating in the activities. A breakdown of the episodes constituting the second session (with ICTs) results in the following table:

Table 6.3 Overview of episodes in session 2 (March 06)

Episode	Duration	Core Activity
1	2:00	Instructing learners about activities in the following sessions
2	12:38	Scaffolding and guiding log-in routines. Mostly on individual basis
3	4:05	Guiding and instructing learners in the technicalities of the NiceNet conference
4	8:00	Triggering the 'Haifaiv' dummy participant
5	3:37	Scaffolding the conferencing exchanges
6	0:28	Addressing the researcher
7	10:40	Scaffolding
8	3:20	Discussing technicalities with learners

The reason for approaching class and teacher via these two sessions is found in the present researchers aim to capture an extended design; how Tom uses a variety of artifacts, and how ICTs are embedded in the total design, how technology is woven into a particular social practice – the online conferencing – and how it might transform the practice of discussion in an educational setting.

On March 06, *Relationships* is the topic of the day. The class has in the previous session read a short story in their textbooks about a young woman and her relationship with words (and

[138] In this and the following tables, duration of episodes is stated in minutes.

two men), *Parker 51* by Lesley Glaister. Today, this topic is followed up in a variety of ways; learners hand in a short text on what they think is important in relationships (return rate seems somewhat poor). Next is a storyboard sequence centering on a moral dilemma followed by a plenary discussion. This is then followed by a survey in the humorous vein, and finally there is an online discussion on relationships using *NiceNet* (cf 6a,b, and c in Table 6.1) In order to fully understand the activities in an ICT-rich setting, it is consequently necessary to study previous designs and some of the activities leading up to the practices that take place online. The online setting means there is potential for practices, such as plenary discussions in the written mode, which cannot be easily fostered in other ways. Tom's class should by now be used to entering this online mode of communicating, having used their own virtual classroom on a few occasions. All this requires a careful orchestration of affordances and constraints (Kennewell, 2001) during the 3 x 45 minutes while aiming at keeping the topic in focus throughout.

These two sessions are rich in examples of the teacher working at the interface of physical and virtual environments and also at the interface of literacies and technologies. At every stage, Tom seeks to engage learners in interaction, in eliciting not just words but articulated thought and reasoning. This is a difficult task in a class that is somewhat reticent on the one hand but prone to private comments, jokes and snide remarks on the other. Consequently, the session is in many ways an example of how the teacher through orchestrating affordances and constraints tries to build a discourse community. Also, it shows how the teacher balances between the school setting with its institutional and curricular practice on the one hand and the learners' lifeworlds on the other.

6.4.2. Introducing the topic

Instead of starting up in the computer labs as usual, learners have been told to meet in the classroom. This has not been registered by all and there are a few protests and latecomers as Tom tries to legitimize today's assignment in the following sequence (from session 1, episode 1, cf Table 6.2):

> T: Hello!
> Ls: Hello ((*one boy repeats* 'Hello' *in a Mr Bean sort of silly voice*))
> T: ((*echoing the Mr Bean voice*)) Hello. For the future, eh, you may meet here, in the classroom… the first class. I'm very sorry to disappoint the computer… nerds, or geeks, or whatever is the term, but, eh, we can't, well <u>some</u> of you feel that, y'know, five classes in a row in a lab is a bit too much and I understand that
> ((*some latecomers arrive*))
> T: Yeah. I expect you went to the auditorium or something? OK, We <u>are</u> going to the lab later on, just to… calm you… computer guys down, eh, but eh, first we're going to talk a little bit about friendship and relationships. That is perhaps… the most important thing – isn't it?
> L: Yea
> T: Because you have success and everything but no friends, you are not very happy
> L:((*boy singing*)) got no friends….
> T: First, I'm going to, eh, show how good I'm at drawing

The above episode sets the mood for the day. It is casual, joking, ironic signaling that this is a permissive session, and this immediately seized upon by some of the learners. It is sustained at various intervals as more latecomers arrive, and in some of the exchanges that take place.

In the last line, Tom moves into episode 2 by introducing the first artifact (apart from the textbook and the short story from the previous week) in the form of a drawing on the

blackboard; a series of sketches, (Tom: "…a little film sequence?") that illustrates Tom's tale. This is the scenario that according to Tom's design should trigger spoken exchanges: Jane is spreading a nasty rumor about Samantha. A third girl overhears the gossip, and tells Samantha about this. Samantha cries, and is comforted by her friend. Next, Samantha gets angry and on meeting Jane pours a cup of yogurt over her. This is illustrated by four sketches and some key words on the blackboard. The learners laugh good-naturedly at Tom's simple drawings, and there are a few snide remarks, but they are drawn into the story. Episode 2 is about to ends as Tom moves from giving information mediated by talking and drawing into requesting suggestions from the learners:

> T: OK? (pause) Fifth scene. (pause) what happens?
> L: Chick fight ((*laughter*))
> T: A big fight?
> L: Chick fight
> T: OK. And now what?
> Ls: More chick fights
> T: More chick fights? Please…
> Ls: ((*mumbling, suggestions*))

Boys offer several sexually biased hypotheses as to the nature of the rumors. Sometimes, Norwegian words are used. As frivolity threatens the whole project, Tom is forced to plead for more serious suggestions and he also uses irony to target the boys:

> T: Aha. OK, eh, the boys are working here, at least. They are on their right track to manhood, and testosterone levels and….

This turns the focus away from the scenario for a while and to a discussion as to whether the same rumors would be applied to boys. It is one of those occasions where a potential disruption could be turned into an asset as the boys are approached within their own script. However, the moment passes quickly and the episode ends with a return to Samantha's reaction (pouring yogurt):

> T: What do you think about that reaction? ((*silence*)) Is it understandable? Is it a wise thing to do?
> Ls: No. no
> T: Lillan, you don't think so? Why not?
> Lillan: Because you can't do that, you should talk together first…
> T: OK. She should talk to Jane?
> Lillan: Yes

It would seem that so far, there is a gap between potential and actual activity in the design. Tom struggles with bridging this gap through IRF (Initiation – Response – Feedback/Follow-up, cf Chapter 4.7.2) sequences that often produce short and sometimes even provocative replies or comments. Still, there is much laughter from both learners and teacher, and there is a feeling of a shared culture in class. However, the design seems threatened by the current culture of frivolity. The affordances orchestrated by Tom, the supporting features of text, talk and drawings, make it possible for learners to sidetrack because there are too few constraints. This is a precarious balance: "affordances and constraints must be considered in relation to the abilities of the participants in the activity they support" (Kennewell, 2001:106). In this case it is not so much the ability as the *willingness* to participate in activities that Tom wants to promote. The learners appropriate Tom's story, infusing it with their own cultural contexts. Still, with learners warming to the subject through offering their out-of-school experiences as

the main input, there seems to exist a potential for transforming the present activity into one where learners could make their lifeworlds an important constituent of the total learning experience. According to Lankshear et al. (2000:129), "Learning must be connected to the sorts of things people do at later points in their life trajectories". It must also be connected with the individual and collective-cultural prevalence of the learners, in this case a variety of youth identities.

6.4.3. Orchestration[139]

In episode 3, Tom starts introducing more elements into the storyboard, concentrating on Jane's motives for slandering Samantha. The learners are more eager to participate, but on their own terms: In response to Tom's question as to why Jane is doing this, a boy suggests:

> L1: She is a jealous person
> T: Jealous about what?
> L1. Everything]
> L2: [Maybe about Samantha's]
> L3: [Maybe Jane is an ugly bitch ((*laughter*))
> T: Mhm. You know what, Jane's got a friend. A very sturdy young man ((*draws on the blackboard, laughter from learners*)) … with lots of hair, and lots of talent and lots of character

Whose story is unfolding? At this point Tom introduces Jane's boyfriend, Joe. But it might be as a result of L1's hypothesis about Jane being jealous. Seconds later:

> T: What is Jane trying to do?
> L: She is trying to… because I think, this man…hehe, the guy…
> T: This … Joe, we can call him, Joe, this sturdy, nice young man…
> L: He likes Samantha…
> T: Yes!
> L: And she ((= *Jane*)) don't like it, so she have to say something bad about Samantha

At this stage, the learner adds her own little twist to the story, enthusiastically encouraged by Tom. There is a joint construction of a plot and it serves as an artifact that mediates the talk into a more abstract domain of ethical aspects. Tom reminds the class that it was this girl 'X' who told Samantha that Jane was spreading rumors. Now he asks them if they think this was the right thing to do.

> L1: It depends whether she's a friend with Jane *(unintelligible)* … if she was a loyal friend of Jane she wouldn't say anything, if ehm, she's got a moral she would tell Samantha…
> T: The ethical thing to do is to tell Samantha?
> L1: Yea.
> T: Why? It was a private conversation
> L1: yea, but the rumor was *(unintelligible)*
> T: The rumors spread
> L1: Then it's not private anymore
> T: It's not, it's definitely not. Anyone who thinks that, eh, this 'X' girl should not tell Samantha? That was a bad thing to do?

[139] The metaphor of orchestration used throughout the following pages is, of course, related to that of conducting an orchestra. The metaphor of the teacher as conductor is e.g. used by Jeremy Rochelle and Roy Pea in their discussion of how Wireless Internet Handheld Devices (WILDs) may change teaching and learning (2002). However, if metaphors of music are to capture the essentials of activities such as the ones referred to when using NiceNet (cf Chapter 6.4.5 below), the jazz metaphor may be more apt with its classical structure of a short thematic statement before musicians ad-lib over this theme, but still sticking to the basic chord structure andusually following the band leader.

L2: She is not a loyal friend
T: No, she's not a loyal friend but… sometimes…. but, I mean, what if they were friends, Jane and this 'X' girl, … is it sort of a good thing to keep quiet about, to keep quiet about it?
L2: the 'X' girl is not a friend. ((*more voices, engaged*))

This sequence is one where the affordances of the (traditional) school setting make it possible for learners to involve others in their thinking. It is an example of what Neil Mercer (1995:4) calls "language as a social mode of thinking" (and which becomes a recurrent feature as the class later moves into written mode online). The discussion turns to whether spreading rumors is a typical female activity and as to whether there are differences between girls and boys when it comes to sharing feelings. Tom orchestrates affordances and constraints by introducing new possibilities, keeping learners on task using irony and humor, sometimes intervening by snapping his fingers to get attention, posing a question directly to a learner, while being lenient as to utterances reflecting learners' lifeworlds. It is a repertoire of *cued elicitation* (op.cit.:26), getting learners to talk by providing a series of verbal and non-verbal hints, clues and suggestions. Question-and-answer routines can often be limiting when the aim is only to elicit just answers, right or wrong, but here Tom is asking questions that are not just dichotomous or rhetorical, learners are addressed as persons with valid knowledge and opinions. Talk is always situated, and episode 3 is an example of how a combination of strategies is built in order to communicate with a particular youth culture. It also shows more direct intervention by the teacher.

Artifacts in use are also part of the orchestration, from the various types of discourse to the material ones represented by chalk, board, and drawings. They evolve as the episodes in session 1 unfold. Also, as will be clear from the following session, the teacher does not only orchestrate affordances and constraints directly, but through artifacts like e.g. his website especially designed to cater to his classes or delegated to the virtual classroom (see below).

Orchestration may be *proactive* as in the case of Tom's careful planning of the affordances he introduces (storyboard, survey, virtual classroom) or *reactive* in the sense that he has to improvise at the many unexpected turns of events that constitute this particular classroom discourse. Ability to react to the unexpected and improvise is typical of Tom's teaching style.

The class is participating in the talk, but only six learners are consistently active during the 13 minutes and 40 seconds episode 3 lasts. About as many do not take part at all. This is a situation that the present researcher with his 20 years of teaching practice would find 'typical' of a Norwegian class. However, this may be a phenomenon not exclusive to Norwegian schools only: "All the evidence from research tells us that, in most classrooms, the range of opportunities for learners to contribute to talk is quite narrow and the amount of talk they contribute is relatively small" (Mercer, 1995:60). It would still seem that this episode captures elements of authentic forms of social practice, authentic in the sense that such practices are often unconventional in a school discourse but meaningful to learners at this particular point in their trajectories. Also, the episode shows that even with the somewhat restricted opportunities afforded by the IRF sequences learners can shape and give direction to the talk. What is lacking, though, is extended learner output or rather: despite Tom's efforts to engage learners they do not seem to have found a space or room where such output comes naturally.

6.4.4. The role of artifacts

Approximately 23 minutes into session 1 (and leading into episode 4), Tom introduces another artifact in the form of a sheet of paper (copies for all) with 25 statements as to what to

do on a first date, seen from a boy's perspective (Tom: "Ahm, sorry, this is what a boy should do on his first date, yea. I, I didn't feel competent to make the other one"). The questionnaire is professionally laid out with a word processor and with some intermediate level vocabulary (*considerate, biceps, memorize*) as well as typical street phrases (*hang out, burn rubber*). It creates an immediate interest, and all are on-task during this activity. Two episodes constitute the activity generated by the questionnaire (episode 4 and 5 in Table 6.2); one of introduction and instructions as to how to fill in the questionnaire (*Excerpt 1* rendered below), and another in which answers are discussed (*Excerpt 2* rendered below). Learners are to put a cross beside statements that describe the correct things to do. Like the short story in the textbook, the drawings and the chalk and blackboard, it mediates a certain activity, a certain talk and a mode of thinking. However, the way this last artifact is ironically introduced by Tom places him in a particular role; he takes on a certain form, plays out a role:

[*Excerpt 1*]

T: Now,… ((*more talk from boys*)) to help you further on in your life, I have created this, ah, 'What to do on the first date?' ((*Laughter, remarks from Ls*)) Yes! Hehehe, and you were about minus six years old when I had my first date. And I've had lots of dates since that
Ls: ((*with irony*)) Yeeeeaaaa
T: Not since I was married, but…]
Ls: [oooohhhh….
T hehehe, but I… I know a lot about this, so I have the correct answers, and I know I have the correct answers, I know some of you will say 'No, you're wrong', and I will forgive you. It's OK. You're 16, I'm 36 ((*laughter*)) so it's OK to disagree, but please, when I say it's right or it's wrong, that's the… truth

After ironically addressing the lifeworlds of the learners, Tom mediates this new activity by actually turning into an artifact himself; a role figure learners recognize as the know-it-all, the overconfident and arrogant elder. But it is done with such mockery that nobody takes it seriously, the character becomes an object to think with. The act becomes the artifact (cf Chapter 2.3.3 on artifacts). During the rest of this episode, this stock character triggers a lot of response. However, time is running out, and Tom has to speed up the process of going through the statements. Commitment is high:

[*Excerpt 2*]

T: Three: "You spend a lot of money on her"
L: Yeh
T: No, you don't
Ls: Huh?
T: No, you don't
Ls: ((*protesting, several voices, some in Norwegian*))
T: Keep it in English!
Ls: Yes]
[yes ((*girls' voices*)).
(…)
T: Girls are sensible, they don't want a guy who spreads around money
L1: (boy) Yeh]
L2: (girl) [Why not?
T&Ls: ((*laughing together*))
T: Right. OK. Anyone… no cross on that one
Ls: Yes!
T: No cross on that one
L3: (boy) Veto power!]
L4: (boy) [Power to the people!

The above sequence ends on a sociolinguistically interesting note where discourse from political institutions is immediately followed (by associating the word 'power') with a slogan from the 70s. It is a moment of Bakhtinian appropriation[140] in which learners bring elements from their lifeworlds into the teacher's script. This opens up an elusive opportunity, a teachable moment if the form of a shared third space (see Chapter 6.4.7) but this is not pursued by Tom. Episode 5 (10 minutes long) ends with learners checking how many 'right' answers they got (according to Tom). This is followed by a short episode of instructions in the form of written assignment as homework: The learners are to continue the story of Samantha, Jane and Joe. Tom's design is thus sustained beyond the sessions that take place on March 6. By now, we are well into the break.

In session 2 (episodes 1 – 8 in Table 6.3), ICTs will play a crucial role as learners enter the virtual classroom, *NiceNet*. However, while it is easy to see *NiceNet* as mediating certain communicative practices, it is worth noticing that this is but one of many instances of mediating artifacts in use. The episodes discussed above show that Tom uses artifacts of diverse kinds in orchestrating events within his design on 'Relationships'. His form of practice thus makes ICTs a natural, almost seamless, continuation of his teaching style. But while the first session has very much been direct orchestration with Tom in the conductor's role and relying to great extent on an IRF approach, the following session illustrates orchestration through digital resources. There is a shift in the teacher's position. The question is as to what extent this shift in position, together with the new artifacts in the form of an online discussion forum and a provocative 'dummy participant', represents an extension of the practices we have seen so far, or whether they mediate new ones and thus open up new spaces for learning and teaching.

6.4.5. Bringing it all back online

The previous day, Tom has, as part of his design, posted a note in the 'Messages' section of *NiceNet*. In other words, the Initiation move is indirect and mediated by a technological artifact in the form of a learning management system:

> FROM: Tom (03/05/01 6:27 AM GMT -06:00)
> SUBJECT: Relationships
>
> It is not always easy to stay friends. Sometimes we do or say things to each other that are hurting or disrespectful. The closer we get, the more we can hurt each other, and the more we know about each other the more it hurts. How do we behave and treat each other to make a relationship last?

At the onset of session 2, learners are through a two-minute instructional episode told to post replies to Tom's observations and question (episode 1 in Table 6.3). Learners are told to write at least two or three entries each, and to avoid bringing up embarrassing incidents from which people can be identified (this is observed by all). Learners are also told that they can choose whether they want to address others in the plenary mode or one-to-one (*NiceNet* affords both options). Learners log on to the Net, only to discover that the network is slow. Nearly ten minutes are spent trying to get the browsers working for all, Tom is thinking of abandoning the whole thing when the network picks up speed and learners log into their virtual classroom, some with help from Tom. One pupil has not been able to register despite the fact that they

[140] Cf Bakhtin's view that the word is half someone else's, it borrows from others and projects intensions at the same time, see also the Bakhtin quote at the beginning of Chapter 2.3.5.

should by now feel comfortable with *NiceNet*. Tom patiently guides her through the procedure.

With everyone logged in (episode 2) and the network functioning exchanges start to materialize (episode 3). The topic of 'Relationships' stays the same as in the previous session, but the learning environment has changed. However, despite the introduction of the networked environment, this is not a strictly distributed activity but a hybrid; learners are communicating *as if* they were miles apart, and this 'willing suspension of disbelief' seems to result in a substantial production of postings. The logs show that the ones who were reticent or off-task during the face-to-face plenary, seem to gain a voice online. One learner (immigrant background) writes:

> FROM: Mei Li Vu (03/06/01 3:30 AM GMT -06:00)
> SUBJECT:
> yeah is all about respect.u must respect eachother and be honest,so u can trust eachother.a realationships can't work when is doubt in the picture.u need to sit down and take a seriuos talk when u have something on ur mind.

This entry shows how a learner who has been mute in the previous session is gaining a voice online. The introductory 'yeah' shows how she immediately picks up on Tom's line of thinking. The girl addresses Tom directly and several times, not as a teacher but as the role figure he holds up; as just another participant (although responsible for starting the exchange). Mei Li's life world can be tapped for experience in this semi-virtual environment, and this process is mediated by the 'faceless' and less confronting dimensions of the virtual classroom[141]. The language is influenced by Netlish and SMS (cf Chapter 3.3.1) but despite the deliberately unorthodox pronouns and unintentional mistakes, Mei Li's entry carries substance as well as coherence. It is not merely a response; she also elaborates a point (respect), thus approximating the discussion move in Mercer and Wegerif's (1999) IDRF structure (cf Chapter 4.7.2). It would seem as if Mei Li's contribution materializes as a result of a new opportunity, a space related to affordances in the *NiceNet* environment.

Another reticent pupil makes several postings, but sticks to his ironic style and the snide remark he cultivates in 'traditional' sessions. The following two instances (they would correspond to level 3, layer b in Figure 6.1) take place 12 minutes apart, and they are both directed at previous postings:

> FROM: espen lie (03/06/01 3:31 AM GMT –06:00)
> SUBJECT: Eirik da...
> I don't think you'll get a better way by using the Harald/Per (brown nosing) method.. but you can try

> FROM: espen lie…(03/06/01 3:43 AM GMT –06:00)
> SUBJECT: how to make a relationship last
> if you want to know how to make a relationship last, just read the entries on this page. *LoL*

While Mei Li addresses the teacher, Espen addresses classmates. This is a variation of the discussion move seen in Mei Li's contribution (above). Espen's use of the perhaps

[141] There are several examples of learners who are reticent and shy in face-to-face situations but who get a voice online. See e.g. *Building Communities in Cyberspace* (Palloff & Pratt, 1999). Also, the present researcher experienced in his own teaching practice how an anxiety-ridden learner, who needed to be accompanied to school by her mother and never engaged in socializing, found a voice through *NiceNet*. She could make use of the virtual classroom when she felt like it, also from home. Gradually she was able to engage in face-to-face interactions.

objectionable term *brown nosing* causes extreme interest with classmates rushing over to his place in order to find out the meaning of the term. He has a very good command of English, and this is recognized by his classmates. However, it appears that several of them already know the expression. The second message closing on the acronym for 'laughing out loud' is another example of 'Netlish' or SMS language finding its way into classroom practices. Other learners also seem to favor experimenting with language as they post messages to the conference[142].

Some messages are quite articulate and show how the abstract notion of relationships is tied to learners' experience of them:

> FROM: Petter Stenseth (03/06/01 3:43 AM GMT -06:00)
> SUBJECT: Making it work is not easy...
> Making a relationship work is not easy. Even though you shouldn't have to, making a relationship last is hard work. In the beginning it's not that hard. The relationship is blooming, and you're excited - about being in love, I mean. But after having been together for some time, things may start falling apart. Problems may apeare, you start to take the relationship for granted, and your feelings may weaken. And this is where the tricky part comes in: In order to make a relationship last, you have to try to pull through the rough times, aswell as the good times. This is how to make it work if you have been dating/together for a longer period. But in order to get this far, you need, in adition to strong feelings and faith, honesty, communication and respect. These are some of the basics in making a relationship last....

A distinct feature of the postings is the strong personal voice found in them. The hybrid genre of spoken and written language affords conventions that would normally not be found in purely written or oral classroom exchanges. For instance, Tom's initial posting seems to speak directly to learner Harald who addresses his teacher in a mode and with a lexicon (and typography) that carries strong emotional content:

> FROM: Harald Gundersen (03/06/01 3:41 AM GMT -06:00)
> SUBJECT: Re: How to make it(friendship) last...
> Tom, why are you looking so pessimistic about this issue??? The more you know the more it hurts... In my opinion the more you know the better; it's great to have someone you're confidential with, someone you really trust. You don't tell "secrets" that friends have told you to others, NO MATTER WHAT; it's a matter of principles... Even if you're not friends anymore, you keep your mouth shut. I don't see where you're trying to go with this, Tom. In a relationship(/friendship) there are certain rules/principles that you don't try to follow; YOU FOLLOW!!! For instace: You don't hit on/sleep with your (best-)friend's girlfriend(and x-girlfriends). You tell eachother if there is something that bothers you. What I have written is just my opinion; but I think most individuals who have a very close friend, would agree with me(or at least they should...) I have a very close friend(Per), and I can't imagine him telling things to others that could hurt me(I can't imagine him telling anything to others...) So, Tom, I don't see were you're going with this.

It results in this response from Elisabeth:

> FROM**:** Elisabeth (03/06/01 3:51 AM GMT -06:00)
> SUBJECT:
> Harald: I share your opinions, but what I also mean, and what I think Tom ment is that the better you know a person, the more it COULD hurt(it doesn't HAVE TO hurt...) When you know a person THAT well, you know that persons thoughts and even feelings, and it's

[142] A more detailed analysis of such practices can be found in Lund (2001).

> sometimers easy to say or do something hurtful...But I agree 100% when you say that it's great and SO valuable to have a friend THAT close...:)

It is interesting to note how Elisabeth wants to correct Harald's interpretation of the teacher's intention. Such attempts at influencing ideas and views in the postings of fellow learners are quite common and might be said to constitute a pattern in the online exchanges (cf Espen's ironic remarks above). Negotiating interpretations is very common in authentic discourse, and in an environment deprived of auditory, facial and bodily communicative means the importance of textual negotiation increases. To compensate, it seems that learners develop very strong identity markers through stretching and transgressing traditional conventions in this hybrid mode of communication. The electronically mediated exchange opens up for modes of expression that afford a closer proximity to participants' lifeworlds. A similar observation is made by Kuure et al. (1999) who discuss negotiating in web-based learning environments. They find that teachers can never be sure how their mentoring and feedback are interpreted by learners, and that "participant roles are actually constructed several different ways in a web-based learning environments [sic]" (op.cit.:4).

During episode 3 the net has picked up speed, and learners are starting to post messages at an increasing rate. However, those who write long texts experience that if *NiceNet* is left idle for some time, they automatically become logged out and they will have to re-enter. Learners who are not very ICTs proficient seem to experience frustration at the slow network and the unexpected interventions by the technology. Tom is permanently appraising the state of affairs, sometimes being on the verge of quitting the activity, when in episode 4 he decides to introduce 'Haifaiv' (the Norwegian phonetic equivalent of 'High Five'), a dummy participant that has been used by Tom in sessions before the ones observed by the present researcher.

'Haifaiv' started out as Tom in disguise; an external hacker who somehow cracked the key to the *NiceNet* classroom and who makes provoking appearances when learners are conferencing. When some learners started to suspect the identity of 'Haifaiv', Tom let colleagues take turns (when they were available and had computer access from other rooms) so that 'Haifaiv' remains intact and undisclosed (Tom has suggested he's a Swedish hacker). His deliberately poor command of English serves as an extra provocation to Tom's class. Now, Tom asks the present researcher to discreetly launch 'Haifaiv' from an available PC. The following message appears on learners' screens:

> FROM: haifaiv . (03/06/01 3:27 AM GMT -06:00)
> SUBJECT: only fools stay in love!!!!!
>
> haifaiv's laws of lasting love:
> 1. never admit you're wrong
> 2. yoou're the man, remember?
> 3. gurls shoud make the food
> 4. mothers in law shoud be shooten
> 5. man power!!!!
>
> I know, you dumb little pupils. I have bin there & dun that.
>
> haifaiv have speaked wonse again.

This causes an immediate reaction, both orally and in writing. From the transcript of spoken reactions (Norwegian original in italics and square brackets):

L1: Haifaiv's here, he's gross! Grossest message I've ever seen! *[Nå er haifaiv inne igjen, han er rå! Råeste innlegget jeg noen gang har sett!]*
L2: I'm sure it's one in here! *[Jeg er sikker på at det er en herfra!]*
L3: Oy! There's Haifaiv! *[Oi, der er haifaiv, jo!]*
L4: Haifaiv's back. *[Haifaiv er kommet tilbake.]*
T: hehe Haifaiv?
L5: Haifaiv's here. *[Haifaiv er her]*
T: The Swede?
L3: What does he say? *[Hva er det han sier?]* ((*more sounds of reactions to message*))
T: ((*Reading Haifaiv's message*)) Ha! OK, tell him to… leave the message, or the conference
L3: He should stay on, he's cool! *[Han må jo være der da, han er kul!]* ((*more reactions follow*))
T: When, when, when is it… it's today… just tell him to… well, ask him who he is and…
L: Hm?
T: Ask him who he is and where he, where he comes from and… ask him if they got any wolves left[143] ((*pause, sounds of comments and typing*))
T: ((*to learner who just managed to enter the conference*)) OK, you're in.
L6: Affirmative!
T: You're in, Stein.
((*Ls discussing use of 'affirmative'*))
T: Mhm. Ten-Four hehehe

There are a few written responses as well. They attack or ridicule 'Haifaiv':

FROM**:** espen lie (03/06/01 3:34 AM GMT -06:00)
SUBJECT: haifaiv...
you have to be a pro hacker to join our account. huh ? .. by the way .. where did you learn you english ? it could be improved slightly.. but at least its entertaining to read for us dumb pupils.. hehe ... espen has speaken wonce agein

Tom turns to the researcher, satisfied with the reaction (translated from Norwegian):

T ((*to R*)): We'll just have to see whether it takes off or not. I had hoped they, I'd hoped they would get into each other's entries
R: Yeah, they don't?
T: No
R: Well, it takes a bit of time
T: Yes
R: But there is quite a bit of discussion
T: 'Haifaiv'? hehe

The exchanges above show how Tom has designed a learning environment he thought would produce a community feel and peer interaction. While the logs show that this certainly happens after a while (there are altogether 37 postings in the conference by the end of the session), the initial technical glitches have to some extent disrupted what could have been an even more sustained on-task oriented session. Despite the time spent on persistent technical trouble Tom decides to continue the conferencing. 'Haifaiv' returns on one occasion, but has since gone silent and learners concentrate on the topic. The session ends with an informed technical exchange between Tom and three learners. Such episodes are frequent in Tom's classes.

[143] This rather cryptic comment alludes to the controversial wolf hunting in Norway at the time. Sweden prided themselves in having been able to maintain peaceful co-existence of wolves and sheep farmers, and Tom has sown the idea that 'Haifaiv' is Swedish.

By introducing 'Haifaiv', Tom is extending the way he used himself as an artifact in the first session, the know-it-all with the obvious flaws. It is an old teacher's trick to take on roles and views in a discussion so as to trigger response. The same trick is a staple ingredient in mass media, e.g. in talk shows, interviews and panel discussions. In an online context, 'Haifaiv' also resembles a character from a computer game, a distributed Internet game, or a MUD[144]. The unanswered questions as to his identity and agenda carries the same sense of mystery young learners might associate with the computer game culture. Another connotation which is brought up is that of the hacker, a powerful (sub-)cultural symbol of defiant behavior. These characteristics turn 'Haifaiv' into an act; his identity does not exist, it is not a property of some participant. But as in the previous session, with Tom acting out the role of the 'expert' on dating, the act has become the artifact.

The task (in the form of the introductory posting) given by Tom in the second session is not generalizable in the sense that it requires a more or less fixed answer. Rather, it is the various levels of participation and the situatedness of the activities that characterize the postings in the *NiceNet* conference. The overall style of learners' postings is phatic and emotional, and serves as an indication of the affective stakes involved. Richard Donato makes a similar observation in a study of the dynamics of instruction and learning in the foreign language classroom:

> *(…) tasks do not manipulate learners to act in certain ways because participants invest their own goals, actions cultural background, and beliefs (i.e. their agency) into tasks and, thus, transform them. (…) teachers need to focus less on task outcomes and more on students' orientations and multiple goals during the conduct of classroom tasks (Donato, 2000:44).*

Although Tom through his teaching style has invited learners to invest themselves in the activities this does not materialize to the same degree in 'traditional' class (the first session) as in the online environment (the second session). The direct orchestration of artifacts and semiotic resources in the first session (textbook, questionnaire, classroom discourse and acting out roles) instigated certain practices that are easily recognizable within the IRF model.

The above examples suggest that ICTs do not just extend or sustain these practices, but can transform them according to learners' lifeworlds and agency. As Donato puts it, ICTs can afford "the overpowering and transformative agency embodied in the learner" (op.cit.:47). In the examples we have seen, this is operationalized in IDRF sequences; learners do not merely respond to an initiative but elaborate, discuss, address others, and display agency; i.e. they increasingly colonize the 'D' move.

Another way of interpreting the two sessions analyzed is to view the ICT-infused activities in session 2 as an expanded zone of proximal development (cf Chapter 2.3.6). New spaces and, consequently, new practices are afforded and they are intimately linked with the nature of the artifacts and how they are used. The interactions observed in Tom's class form a collective ZPD where new types of societal activity emerge. The individual learner engages in collectively generated communicative processes that are currently developing. Thus, we see how the ZPD in the online episodes discussed above transcends the (mechanistic) image of an identified, new level to be reached. Instead we see how practices in the online setting have become transformed compared to those in the traditional classroom setting. Such

[144] A MUD is short for Multi-User Domain (or Dimension). When a MUD affords the creation of or manipulation of objects, they are referred to as MOOs (an Object Oriented MUD). For a discussion of identities in MUDs, MOOs and related environments, see e.g. Sherry Turkle (1995).

transformation, then, points to a view of the ZPD as a zone where collective generative activity develops. However for such activities develop, participants need to appropriate the available cultural tools. Consequently, this issue will be treated next.

6.4.6. Appropriation of the artifact: genotype and phenotype

As was discussed in Chapter 2.3.3, artifacts do not carry fixed, decontextualized knowledge but are inhabited by the intentions of the users. This again has consequences for the environment in which they come to be used. According to Colin Lankshear et al. (2000:36), "When new technologies are introduced into sites of practice, they change the social circumstances within which they are used. The result is often a change in which people talk and think about them". One could add that there is a change in the way people *use* them. In other words, technological artifacts carry properties of *genotype* and *phenotype* (cf Chapter 2.3.3) and the interplay between these shapes the way they are appropriated.

The introduction of *NiceNet* in session 2 is an example of how the social circumstances change. By moving from direct to indirect orchestration, mediated by a virtual meeting ground, Tom's design affords participants a more extensive repertoire of interaction than the IRF model dominating the first session. The social practices in the EFL classroom are transformed as learners continue to write, sometimes extensively, alternately in one-to-one and one-to-many modes of communication. The way learners use the artifact influence the whole learning environment, their cultures-of-use adds dimensions to the communicative practices in the EFL classroom.

Judging by the session studied above and other sessions during the period of observation artifacts seem to have been seamlessly integrated in the linguistic practices of participants while transforming these practices at the same time. To teacher and learners alike, the technology has become *transparent* (Dourish & Button, 1998; Hansen, Dirckinck-Holmfeldt, Lewis, & Rugelj, 1999; Levy, 1997b), teachers and learners are looking *through* – not *at* – ICTs, a sign of cultural appropriation, despite the opening problems. A further indication is the number of 24 conferences and 279 postings this class produced during their time on *NiceNet*, which suggests that technology has become 'naturalized'. The question is whether such 'naturalization' took place as learners participated in school activities, whether it was a result of out-of-school uses, or a combination.

As for class 1aac, there is no data that tell us about participants' histories with digital cultures. These are, as Lemke (2000) reminds us, on a different time scale. However, observing the learners over several sessions left an impression that they were acculturated to online communities from out-of-school contexts. Many of them referred to extensive use of *Internet Relay Chat (IRC)* and chat forums. Consequently, online activities with *NiceNet* proved to be a continuation of their trajectories and represented an opportunity to bring more of their out-of-school identities into the activity[145].

Evidence of online enculturation is also found in the use of the e-turn. According to Steven L. Thorne, who introduced the term in a study of Computer-Assisted Classroom Discussion (CACD):

> *Though an e-turn is based on the "turn", it does not include the notions of linear sequencing and juxtaposition that the conversation analysis approach attributes to the conventional turn*

[145] Although this may be close to conjecture in the present study, the case is convincingly argued by Stephen L. Thorne in a study of learners of French in computer-assisted classroom discussion (CACD) (Thorne, 2000a).

> *[…] Instead an e-turn is defined as a communicative unit that takes its on-screen form from two sources, 1) the way the MOO server receives, orders, and recasts input, and 2) the form and content of the message as typed by the user. […] A user's "message" becomes an "e-turn" when it appears on the public screen as a distinct block of text tagged with the sender's name. As a block unit, then, an e-turn is a bounded individual submission to a CACD dialogue that takes its final form, and placement on the screen, as a combination of a user's typed message, the recast and tagging of this message by the MOO server software, and its final display by the client. (Thorne, 2000a)*[146].

Learners in 1aac seem to have appropriated the e-turn. The entries show that learners alternately address the collective, the teacher, each other, and 'Haifaiv' with ease. The 'shrunken' context provided by an online forum certainly places demands on textual representation of language, but it does not constrain communication by strict linearity and the often intimidating feeling when 'taking the floor' as in a face-to-face learning environment. Mei Li's entry in the first session (cf Chapter 6.4.5 above) is one example of how an otherwise reticent learner quickly engages in communicative practice, and the postings copied in Chapter 6.4.5 show how learners link their messages to previous postings, in the body of the text as well as in the subject line. Also, the lexico-grammatical freedom they express together with very different modes of addressing others add up to a heterogeneous learning environment that bears little resemblance to the more regulated school genres found in e.g. the essay, the business letter, and the summary. Thorne refers to this as being "at the periphery of institutional power" (op.cit.:10). Judged by the heterogeneity and commitment of postings from 1aac on *NiceNet* this position seems to be conducive to learner empowerment.

While the role of *phenotype* might be hypothesized but hard to identify in the case of learners, Tom's appropriation of the online environment can be related to *genotype* as well as *phenotype*. Through his orchestration of artifacts, it seems as if Tom is aware of the dual character of the virtual classroom; how this artifact comes to be inhabited by its users. Firstly, he uses its material, *genotype* qualities, to change and give direction to the communicative activity towards a participatory genre (cf Chapter 5.7.1). Secondly, his identity as a teacher and his teaching style with his predilection for irony, the sudden twist ('Haifaiv'), the *ad lib*-approach and sense of play are infused in the artifact, it becomes embedded in Tom's professional and private world and instilled with particular phenotype qualities. In other words, it is a case of cultural appropriation (cf Chapter 2.3.5).

What we see, then, seems to be the emergence of an extended space for EFL where latitude is a result of the affordances found in the genotype and phenotype qualities of the artifact and the cultures-of-use that colonize them. Such latitude can be seen in emerging IDRF variants. Initiation may still come from the teacher, but just as well from a learner. In addition, the technologies involved (PC, network, *NiceNet* platform) can be seen as initiating certain interactions by affording the e-turn (cf Thorne's description above). The result is a distinct 'D' (discussion) phase in the overall interaction. This represents new opportunities for learner involvement. Lankshear et al. (2000:138) illustrate the issue: "Young people who have grown up with new technologies may become thoroughly confused, or bored and disaffected, when confronted with 'odd' or 'naïve' practices introduced by teachers in desperate attempts to find uses for new technologies". To counter such situations, Lankshear et al. advocate "forms of practice that are 'non-conventional' for education, such as elements of youth culture"

[146] Although Thorne refers to the way a MOO server shapes a posting, the argument applies to the *NiceNet* server as well. An important similarity is how postings written in reply to a previous entry is queued by the server to appear after other entries in the discussion. An important difference is that *NiceNet* affords threaded discussions, while a MOO will (usually) queue entries consecutively. Both environments require a particular literacy from participants.

(op.cit.:153). Throughout the two sessions presented in the previous pages, it would seem that such elements are an integrated dimension of Tom's design.

But in addition to the dual (or rather: multiple) nature of the artifact, there is another element that is significant in forming the learning space. It the various *scripts* that influence the nature of participation in educational endeavors.

6.4.7. Scripts

As discussed above, when people encounter technologies they do so from a position that involves a certain phenotype and a culture-of-use. In addition, there are *scripts* (cf Chapter 3.10) learners and teacher execute within their learning communities. These scripts amount to recurrent discursive patterns of activity that are expected in accordance with the contexts they are executed in.

Teachers' scripts are closely associated with the institutional discourses of curricula, educational policies and the social practice of exams (cf Chapters 1.5 and 3.9.6); the script represents an institutional discourse, an official space. In the sessions referred to above, this official script is represented in Tom's attempts at engaging the class in discussing the ethics involved in the story about Jane and Samantha and also in trying to get them to discuss the values of relationships in the online conference. This is the script in which Tom 'resides', in which he represents the authorized view of curriculum as well as larger societal values through recurring patterns, an orientation learners have come to expect.

Learners do not necessarily share this socially constructed orientation and may instead launch their counterscripts. Such counterscripts may deviate from the teacher's script in content as well as in register and lexicogrammatical conventions. Examples from the sessions described in the previous pages include the opening sequence where a boy adopts a Mr. Bean voice, where some boys introduce the '*chick fight*', and where the word play on '*veto power*' and '*power to the people*'. Counterscripts sometimes surface as in the previous examples, sometimes they are found in the snide remark, '*Maybe Jane is an ugly bitch*', and sometimes silence equals this underlife. In one sequence (not rendered[147]), some boys exchange sexually oriented speculations as to the origin of the rumors. In the online conference, counterscripts are e.g. found in Espen's use of '*brown nosing*' and an extensive use of sub-cultural language conventions. In sum, typical of the counterscript will be references to sub- and youth cultures, rarely acknowledged in official space. These references occur spontaneously and randomly and will, as a rule, not be followed up by the teacher.

Most times, Tom tries to get learners back into his official script. However, there are instances where teacher's and learners' scripts intersect, where the inherent conflict between scripts are transformed into a new and common ground from which it is possible to assemble practices that incorporate both scripts. For example, in the first session the sexually oriented snide remarks from boys are used by the teacher to instigate a brief discussion as to whether the type of rumors discussed could be applied to boys. But these are transient moments and a possible joint script is not developed and sustained beyond a few exchanges. However, in the second session, on *NiceNet*, the technology seems to sustain a practice in which the separate scripts merge. Through a material structure that affords a participatory genre and the opportunities to articulate different cultures-of-use, learners' 'local knowledge' and teacher's

[147] For reasons of space some of the recorded and transcribed data is not included in full and only referred to, when the present researcher considers this sufficient to bring about a point.

institutional orientation become reconfigured in a joint practice. It is similar to the unscripted, 'third space' (Gutiérrez & Rymes, 1995;Gutiérrez & Stone, 2000, cf Chapter 3.10), where a polyphony of voices compete and mingle, thus sustaining a practice where learning and teaching are just two aspects of participation.

It is interesting to note that the online conferences are noticeably less prone to disruptions and counterscripts than the face-to-face setting in the first session. The online conference, even in the somewhat limited *NiceNet* setting, seems to produce a new communicative space and new opportunities for communication. The number of postings, their mostly on-target and relevant character, and their often phatic and lifeworld-related qualities testify to the commitment of the participants. However, this may not be attributed to the affordances of the technological artifact alone. We also need to examine teacher and learner roles, the role of the school subject and the way it is encapsulated in the form of the exam. These issues will be raised in Chapters 6.6 and 6.7.

6.4.8. Time, Space and Teachers

Finally, it is relevant to return briefly to the questions of place and time visited in Chapter 6.2. Physical classrooms are places that are bounded by their architecture and, to some extent, by the educational discourses that go with them. Virtual classrooms are bounded by the constraints of digital engineering as to what they afford, but they do not occupy a physical space, and they transcend the time element found in the 45 minute session with their opportunities for synchronous as well as asynchronous communication. Together, the physical and the virtual classroom form a "complex social-material arena" (Thorne, 2000a:11), an interface where shared moments can add up to social lives.

It is for the teacher to traverse such interfaces, between scales of place and time and at the interface of physical and co-located environments on the one hand and distributed and virtual on the other, at the interface of the educational design s/he has devised and the social spaces that materialize. For the teacher to succeed, instrumental ability, conceptual understanding and cultural appropriation of artifacts are needed. No pre- or in-service course in word processing, Internet navigation, or email procedures can prepare a teacher for such a complex task. A sociocultural perspective addresses the interaction of learner, teacher and artifact, and how the dual nature of the artifact both influences and is influenced by the users' life world. Such a perspective transcends a mentalistic conception of learning and teaching and places education in a social perspective with all the complexity involved. For teachers, this involves being able to relate to a reconfiguration of educational practices and to acknowledge that participants who engage in ICT-intense practices have access to a broad repertoire of contributions that transform the learning experience and the people involved in it. Although this may appear to be a daunting perspective, the above sessions show that practices that (perhaps tacitly) embrace such perspectives do exist. It does not by any means imply that what we see in the current chapter is an 'ideal practice', but an example that illustrates potential, "what might be" to quote Janet Schofield (1993) again.

6.5. Teacher roles in between systems

6.5.1. From facilitator to designer

Chapter 6.4 illustrates two major teacher roles; that of the *designer* (cf Chapter 3.11) and that of the *orchestrator*. Where the textbook and workbook traditionally have been important factors in forming content and structure of sessions, they are replaced by teachers' educational designs in ICT-intensive sessions. One reason is, of course, that textbooks have not yet

managed to implement suggestions for such ICT-rich designs the way they have for the textual material they present, although they often contain links to online material and in some cases suggestions for use. Another reason is found in the sheer complexity and unpredictability of the learning environment that materializes. There is simply no way to prescribe a 'one-size-fits-all' didactic formula, since the relations formed by learners, artifacts, subject(s), teachers and cultural-historical setting must be negotiated *in situ*. In Tom's case, traditional structuring devices such as textbooks and workbooks are completely missing from the sessions observed (although they play an important part in the non-ICT sessions and thus may have an indirect bearing on the ICT-infused sessions). Instead, an *ensemble* (Orlikowski & Iacono, 2001) approach to technologies characterizes Tom's designs: technologies are not 'given', as something fixed, nor are they treated as variations of the opaque and mysterious 'black box', but appropriated according to the situatedness of the teaching and learning that take place. This makes technologies more transparent and, thus, more accessible for their users.

Designer and orchestrator roles are, of course, also enacted in situations where ICTs need not be part of the learning environment. But with ICTs these roles become much more influenced by the genotype and phenotype qualities of the artifact. For example, a salient distinction between the first (non-ICT) and the second session (online conference) on relationships is found in the way Tom 'retreats' from the orchestrating role and leaves much of the collective structuring and regulating qualities to *NiceNet* while concentrating on individual scaffolding. Kuure et al. have studied interpretation, negotiation, and mentoring in web-based environments, and observe:

> *(…) if teaching strategies are focused too forcefully, the importance of negotiation of meaning may fade. We easily forget that true reciprocity in interaction also involves listening. The more teachers give students space to communicate and elaborate their thoughts and conceptions publicly , the better they can take into account their perspectives in guiding the process (Kuure, Saarenkunnas, & Taalas, 2002: 32-3).*

This, of course, also applies to 'traditional' learning situations but it seems as if the available social space offered by networked technologies is richer in affordances. Also, this must by no means be mistaken for the erroneous belief that a teacher in ICT-rich environments is reduced to a 'guide on the side' and a mere facilitator. In fact, teacher presence and intervention are very much called for, but in different ways than what may be observed in non-technology settings. For example, on one occasion immediately after a session using *NiceNet*, Tom feels that "today was a bit fragmented". Similarly, on one occasion when the network fails from the start, Tom admits that this was "basically a bit disorganized, but a lot of activity! I must be better at sorting tasks". In the middle of one of the more intensive conferencing sessions Tom turns to the researcher with the following comment (my translation):

> One of the problems right now is to keep track of what they are occupied with, because I come across maybe one of 20 messages sent, there are 10 – 12 different conference topics. Some lose their connection, one got an error message, see, so there are so many things to consider, and, like, I don't know what are in the four responses to *'Haifaiv'*. (…) so, eh…. What we should have, you know, maybe two – three teachers, one who was writing messages to trigger writing (…) and one who could help with technicalities, he need not be an English teacher by the way, (…) and one who was there as a teacher of English (…) that would have been all right

It is interesting to note that while Tom works independent of colleagues his vision is that of a working collective. This is not so much an inconsistency as a direct result of the constraints

found in his immediate working environment. A similar observation is found in a study of how a development program integrating ICTs match the work life of teachers:

> *The hectic schedules that teachers manage every day do not allow much opportunity for them to engage in collaborative projects. In fact, many teachers prefer to work in isolation. This teacher individualism is a consequence of the complex organizational conditions and constraints frequently found in schools (…) such as scheduling, accountability issues, and the physical arrangement of classrooms (Yamagata-Lynch, in press).*

Tom's sentiments are also supported by findings from a study of how 'exemplary' computer-using teachers differ from other teachers: "(…) these findings emphasize that effective teaching with computers may be costly not only in terms of hardware, software, training, and human support but may require the costliest element of all – more teachers (Becker, 1994:10).

A bird's-eye view of the sessions recorded during the spring term of 2001 (cf Table 6.1 in Chapter 6.3.2) reveals that in addition to design and orchestration, the teacher exercises roles involving overt instruction (although usually quite brief), intervention, and individual scaffolding and that these are quite common. In sum, we see a set of teacher roles that do not add up to the metaphors so commonly attributed to current teaching practices: *facilitator*, *guide on the side* etc. These are much too one-dimensional and simplistic, they can arguably become vulgarized and may cloak the complexity involved. Instead, the practices that take form during the recorded sessions present a picture of classroom management that requires a complex type of *expertise* (cf Chapter 6.10 for an elaboration of this construct). This expertise is not only provided by the teacher, but also by the learners as they draw on their life worlds and their considerable proficiency in ICTs. Moreover, while a teacher working in ICT-rich environments exercises roles attached to design, orchestration, and mediated interaction, there are other roles as well. They are not exclusive to ICT-intense episodes, but within such episodes roles seem to conflate under pressure; change quickly and subtly, often within the single episode. An illustration is in place.

6.5.2. Role complexity in a single episode

The following episode occurred on January 30. It is part of a session in which learners are working on a brochure from a (fictitious) British travel agency (cf 3b in Table 6.1). The brochure is to be aimed at tourists going to London. It should be persuasive and well laid out. Those who manage to complete the assignment before deadline, are directed to Tom's website to engage in an online quiz. Some learners have work left from a previous assignment on Martin Luther King (cf 3a in Table 6.1). In fact, all instructions and task information are found on Tom's website, and the class is instructed as follows:

> T: Eh, the tasks for today, you will find on the website, which is called '*English links for school work*'. In the top left corner, you will find a link to '*1aac*'. Click that link and you will enter a new site with three different tasks, you will recognize two of them: *Forrest Gump* and *Wounded Knee*, but the third is called *Martin Luther King, London and Quizzes*. Er… that's the link I want you to click and, eh, from there on you will be on your own, or I will of course help you but it's self-instructing from there on. … We will start with the Martin Luther King text you have prepared for today, so I will walk around a little bit and take a look at that one

Regarding the tourist information brochure, learners are advised to search the net for relevant material and transform this material for their particular purpose. This approach is somewhat unusual for the learners in the sense that they, in this case, are not expected to write a text from scratch. Rather, they are told to use suitable material made by others for their own

purposes. Earlier, learners have constructed a biography of Martin Luther King, also by manipulating pre-existing online material.

Several learners need to be guided into writing from the particular point of view that this writing task demands. One learner has called for Tom, she has found a website on entertainment in London but she feels uncertain about what point of view, in a communicative sense, she is writing from:

> T: OK. Eh, you're sitting here
> L: Yes
> T: In ((*name of town*)). You wanna make people go to London
> L: Yes
> T: So, what do you do?
> L: I, I (*unintelligible*) write about what's on in London and]
> T: [mhm
> L: [and what we can get and prices and…
> T; Yeah. So can you pick out three or four things to do here? Like, er… theatre, West End shows, review…
> L. And then you just copy the text into '*Word*' and then you make a brochure?
> T: Right

The guided construction of knowledge in this sequence resembles the form of a syllogism as Tom elicits the learner's conclusion. Also, the learner's conclusion points to a particular hypertextual affordance; the power to manipulate material made by others[148]. This is one type of activity that opens up for an extended notion of literacy (cf Chapter 3.8). As the learners work their way through their assignments, seemingly very much on task, Tom keeps checking on the progress. Individual scaffolding, such as in the example above, is common, particularly as to how the genre of a brochure evolves. As the session progresses demands on Tom become more intense. Several learners call upon him, often at the same time but for different reasons. The written field notes from this session observe:

> Teacher always on the move, always alert, always pulling rabbits out of hat, always constructing feedback, always finding new angles, new input. Extremely complex and demanding work.

However, a reward is found in the fact that the learners write well into the break, absorbed by the work on the brochure. Three learners capture the essence of this working atmosphere (my translation):

> L1: Shouldn't we have a break now?
> L2: Breaks are for sissies!
> L3: This is fun, really!

Table 6.4 (below) represents a list of activities based on a transcribed 8-minute episode near the end of the session. The sequences and instances (level 3 in Figure 6.1) that make up the episode have been numbered from 1 to 14 in order to follow the teacher's movements. This particular episode is framed by a quiet period of learners' autonomous work and a break. It shows how the teacher is faced with a diversity of challenges from the class. The columns and rows represent a 'distilled' version of a series of roles, sequences and instances where the teacher is consulted, where he approaches learners, or where there is some disruption. In sum,

[148] Burbules and Callister (2000:50-60) has a thorough discussion on how this issue involves "people who are intermediary between author and reader" and that "do their work by producing hypertexts that compile, relate, and interweave the elements of different texts in a meaningful and useful way".

it exemplifies the convergence of a variety of roles while at the same time showing how these shift rapidly[149].

[149] During several talks and courses for teachers where the present researcher has used this particular episode to illustrate practices in ICT-rich environments, recognition and identification have been unequivocal. Despite the obvious anecdotal quality of this piece of data, I include it for the significance I attach to several observations of teachers voicing their recognition of the processes illustrated. As with all types of categorization, there is some overlapping, e.g. between subject authority and task interpreter, but the latter emphasizes negotiation more than the former.

Table 6.4 Teacher roles in an ICT-rich environment
Duration of episode: 8 minutes, made up of 14 instances

User support	Subject authority	Organizer	Task interpreter	Interlocutor
1. helps learner: web page does not load				
	2. consulted on vocabulary: "equality"			
3. guides learner in use of WordFinder				
		4. two learners ask permission to hand in jointly made product		
5. guides learner in use of WordFinder				
6. deals with printer crash				
			7. assists learner in starting quiz task	
			8. discusses genre (brochure) with learner	
				9. engages learner in views on London
10. printer: out of paper, refills				
		11. learner asks permission to finish assignment at home		
12. consulted on choice of fonts				
			13. instructs in plenary: check content and form of brochure before handing in	
				14. engages learner in views on football

The table on the previous page illustrates an episode that captures a series of sequences and instances. It shows how the teacher is working beyond the IRF (Initiation-Response-Follow-up) sequence of traditional practices, although the IRF pattern is present in sequences 9 and 14. In the episode as a whole the traditional IRF sequence is replaced by more complex interaction and with little transparency, i.e. it is hard to predict or plan beyond the more general level of assignment and activity. Initiatives are sometimes taken by the teacher, more often by learners, and technologies involved sometimes disrupt and sometimes afford activities.

The table shows an imbalance as to the roles of user support and subject authority. This imbalance does not reflect a lack of learners' contact with the EFL subject, but contact with school subject takes on forms that do not always materialize in direct requests to the teacher. Still, the recorded sessions show that Tom continuously must offer technical support. There is a permanent fragility that threatens the information ecology and the way the class, teacher and artifacts interact. Even though Tom is technically competent and enthusiastic, he expresses deep concern as in an immediate comment after a session (my translation):

> (…) so you cannot trust the net (…) because it may suddenly go down, or it is so slow that you, uh… the machine crashes, certain web pages do not open, some addresses are not available, you get a proxy error, so, looking at it this way you, in fact, miss the classroom where you hand out tasks and they sit there and reply, each with his own pen, and you have total control, while this is like wild west, you see.

At other times, it is software that causes breakdowns and other snags that obviously are connected to the intense use and under-dimensioned maintenance resources in schools. For the rest of the session, Tom keeps walking the rounds, stopping to read, encourage, laugh, and sometimes intervene in order to get a learner back on track. There are similar threats to the conference activity in episodes 2 and 3 (cf Table 6.3). Few teachers would be able to sort out the possible pitfalls and snags without considerable technical insight. Such near-breakdowns are quite frequent and consequently pose a permanent threat to teachers working in technology-rich environments. Still, technical breakdowns are not commonly described in research literature. One might wonder if such concerns seem too 'trivial' to be brought into analyses that address cognitive issues.

However, fragile technologies represent a very real contextual constraint and ought to be addressed as an innate hazard of any attempt at integrating ICTs. In their study of technology use in three different schools, Lankshear et al. found that classrooms were extremely sensitive to deficiencies whether they were connected with humans or technologies: "Fragility was woven deeply into the fabric of practice in several classrooms" (Lankshear et al., 2000:114). This observation holds good for Tom (as well as Helen and Marie at Minerva). However, Tom is also engaged in constructive and creative user support ranging from import of graphics and word processing tricks to the use of HTML code in *NiceNet* and administering electronic portfolios on the intranet. The role of user support thus takes on aspects of problem solving as well as exploiting and exploring the potential in ICTs. The result is a marked intensification of his work, an observation supported by findings from a study of 'exemplary' computer-using teachers: "(…) exemplary teachers make greater demands on available resources and face problems that other computer-using teachers are less likely to face" (Becker, 1994:17). Another, comparative, study of expert and novice teachers points to the risk-taking element as a salient expert feature (Meskill et al., 2002: 51). Intensification and diversification seem to be significant features in the work of a teacher in ICT-rich settings.

But the setting of the classroom does not represent the entire context for a teacher, the classroom is woven into larger contexts that interact with and make demands on a teacher. This will be sought illustrated next.

6.5.3. Interfaces

Through analysis of episodes of the above type (and they occur frequently throughout the sessions observed) the outlines of two contrary activity systems (cf Chapter 2.2.5) emerge. The first system is the one we have come to identify with goals attached to the separate school subject (as they materialize in curricula, tests, and exams) within a division of labor (illustrated by the IRF pattern) suited to the 45-minute unit. Teachers who exploit ICTs within the constraints of this system may come to emphasize the purely instrumental affordances of such tools and not the potential for transcending and transforming established practices. The second activity system will have goals connected to lifelong learning and developing identities from taking part in social practices, e.g. authentic foreign language discourse. This requires a different type of division of labor where the traditional teach/learn dichotomy is dismantled (cf Chapter 3.10). It also requires a type of Multiliteracy that covers a broad set of competencies that are rooted in social, cultural, linguistic, and technical discourses (cf Chapter 3.8.1). Teachers working at the interface of two potentially contrary activity systems will, of course, find it difficult to reconcile the roles they have within them both. At the same time, different roles as anticipated by two activity systems are not always easily conceptualized by teachers, although they may be very much 'felt'. As was shown in Chapter 5.6, one of the more salient findings from *The Tower* survey is teachers experiencing lack of control in ICT-rich environments. This control is an integrated element in goals- and exam-oriented curricula but might be less so in trajectory- and social-practices-oriented curricula and especially when ICTs are integrated in a perspective that extends beyond a crude, instrumental angle.

The genotype and phenotype qualities of mediating artifacts make an ICTs-infused system much more dynamic and less 'manageable' (in terms of keeping control of the curriculum). As such, it can only rarely fit into the cultural-historical construct of the 45-minute, single-subject unit. While the previous chapter illustrates how the teacher works at the interface of literacies and technologies, physically located and virtually distributed environments, the present chapter points to teacher roles at the interface of two activity systems with very different goals, division of labor, and purpose of technologies. There are two important implications as to teachers' practices:

- Teachers increasingly find themselves *working at the interface* of systems that are not necessarily hostile but that sometimes can be seamlessly interwoven, sometimes show tensions and contradictions. Such interfaces are found where traditional literacy meets new literacies and new technologies, where traditional offline, co-located environments meet online, distributed environments, and where a traditional single-subject, exam and curriculum oriented system meets a trajectory- and social-practices oriented system. In sum, school subjects and practices that have been associated with them are undergoing significant transformation, as was argued in Chapter 3. A school subject is constituted through the practices that embody it, and when practices change so does the school subject.
- Teachers increasingly find themselves as *part of the interface*. Through a series of roles, they mediate learners' appropriation of subjects, literacies, technologies, environments and educational frameworks. Through, ideally, informed educational practices they can translate the above items into meaningful activities. Where the novice teacher will struggle with instrumental mastery, control and putting ICTs to

strictly curricular goals (Meskill et al., 2002), the expert will have appropriated technologies to the extent that s/he forms a symbiotic relationship with them.

The two activity systems indicated above offer a material basis for interpreting lack of control as a socioculturally formed category[150]. In Chapter 5.6, loss of control was discussed in relation to epistemological change. Here, we see how the construct is associated with social and organizational factors. In Tom's case, his roles during the sessions analyzed in Chapter 6.4 and his partaking in an alternative exam project (cf 6.7 below) illustrate how he works at the interface of two activity systems and how he serves to mediate between the two. In the face-to-face session Tom tries to control the educational efforts through use of the IRF routine and a series of non-ICT artifacts. In the *NiceNet* session, control is far from abdicated but delegated to a design that involves and supports a high degree of learner agency. Control is distributed and materializes in the on-task contributions of participants. The IDRF variants amount to such manifestations. With technologies affording collective engagement and not just solitary efforts, and with technologies as potential initiators of actions (e.g. suggesting links, affording access, to information, inviting to multilogue practices) we see how the space for communicative practices has become transformed and expanded.

In a study of three schools and their use of an online environment, Lim Cher Ping (2001) makes a similar observation[151]: Goals and objectives affected the way ICTs were used at the various sites. Where improving grades was a prioritized outcome, the technology was used "as the teachers were still carrying out the activities in the same way as traditional teaching and learning" (op.cit.:8). However, at the school where learners were encouraged to reflect upon the subject, ICTS were used more creatively and in communicative ways that "were not possible in the non-ICT lessons" (op.cit.:8). This mismatch between the affordances of ICTs and the constraints in the goals of an exam and grades-oriented system will be pursued in Chapter 6.7 on the term test and the new style exam. Suffice to say that this contradiction is often found among the reasons why teachers do not appropriate ICTs (Becker, 1994, 2000; Cuban, 1986, 2001; Dillemans et al., 1998; Erstad & Trandheim Røn, 1998; KUF, 1998; Schofield, 1995).

Tom does not merely add technologies to an already well-established educational practice. Instead, he attempts to design situation-specific practices in which ICTs can potentially transform traditional practices. The sessions and episodes analyzed throughout these pages show the complexities involved when attempting to make this happen. Also, the quotes from Tom throughout these pages (and in the following chapter on learner roles) show how a teacher reflects on his own practice as an indicator of an ongoing learning process. It is an open question as to who – learner or teacher – is more transformed during the educational practices that emerge in Tom's sessions.

6.6. Learner roles

Teachers do not work separated from their learners, including the roles and scripts learners develop or may have bestowed upon them by the (history of the) institutional setting. These roles and scripts are part of learners' development and should ideally foster agency so as to

[150] A related issue is presented by designers of collaborative environments (Isenhour, Carroll, Neale, Rosson, & Dunlap, 2000). The authors address the relative constraints of classrooms in relation to home and work environments, and in particular the transition between synchronous and asynchronous environments. It would seem that research on how educational institutions at various levels, e.g. schools, communities, districts, appropriate ICTs could give insight into contrary activity systems at play. In the present chapter, institutional appropriation (or lack of it) obviously has an impact on the findings, but it is beyond the scope of the present study to pursue this line of research in full.

[151] Ping's study concerns two A-level Economics courses in Britain. However, to the present researcher this difference only serves to emphasize that the observations from Tom's class are not necessarily domain specific.

participate in mature social practices (Lankshear et al., 2000), whether at work or socially. But Chapter 6.4.6 also show, to some extent, how learners who use *NiceNet* exploit their position 'at the periphery of institutional power' to promote a language repertoire that is closer to their lifeworlds than traditional in-school EFL. The technology affords them an expanded zone for individual development, one that can easily be 'personalized' or 'inhabited' by the learner entering it. The same position affords learners greater opportunities in terms of co-designing activities and peer interaction. At the same time, these opportunities also mean personal responsibilities and challenges.

For this balance to be conducive to learning, due attention must be given to the zones of proximal development within which such opportunities can be taken advantage of. Zones of proximal development can be addressed on individual as well as class level (Chapter 2.3.6 discusses the theoretical foundations of the construct). What we see in online, distributed settings, such as *NiceNet's* discussion forum, is that the conditions for learning change with technologies, collective ZPDs *emerge* so that learners can share views and jointly construct insights. Compared to a view of the ZPD as a space for individual support, a view of the ZPD as collective zone offers an extension of learner scripts and more possibilities for learners to develop their identities.

But the ZPD is also about gaining increased insight in a *subject matter* by being an active practitioner within its discourse. How and to what extent learners' connect with a (school) subject will largely depend on a teacher's designs and how a teacher brings disciplinary expertise into the ZPD to foster advanced forms of learner involvement (this aspect is pursued in Chapter 6.7).

What roles teachers intend for learners are highly relevant in this connection, and although these roles may be difficult to pin down clues are found in interactions and the teacher's running commentary of events that follow below.

6.6.1. Constrained agency

January 23, 2001 is devoted to *NiceNet* conferencing (cf Table 6.1, session 2a), this time addressing a series of topics that are all posted by Tom and with an initial posting in the form of a question or provocation. Some of these topics are leftovers from a conferencing session two weeks earlier. However, before they start Tom hands back written assignments (from before the time of observation), marked and with comments. Learners have been asked to write a report from a (fictitious) tense situation in Los Angeles where environmentalists clash with motorists (cf Table 6.1, session 1). Tom addresses Peter, who has handed in a rather violent account in the vein of Quentin Tarantino (whom Peter admires):

> T: How can you, how can you take a baseball bat and beat…
> Peter: (*unintelligible*)
> T: What did you]
> P: [golf club
> T: and well, what's so much better about using a golf club? What about ethics, er, here at the end? Eh…this is almost like "Natural born killers", just a lot of violence. Of course, the English is good and the fluency is good…

This is said good-naturedly, typical of the lighthearted atmosphere in this class. A little later, Tom is addressing the class, instructing them how to deal with the many topics in the conference section:

T: Try to write a little reply to every one. If some of you have either got a suggestion for a new conference topic or you would like to run one of the conferences, you come to me and I will upgrade you – he-he, eh… as "conference chief", ah, as it is now you can't just create topics, but I, I can enter the system and make you a conference leader, if you like to. And then your job would be to keep the discussion going and to be a little bit provocative and – eh – perhaps mail one of the conference members and say "Hey! What d'you think about this?" Ah, if you'd like to have such a role, you just tell me. (…)
Peter: You can appoint me leader of such a… *[Du kan gjerne sette meg opp som leder av en sånn…]*
T: conference?
Peter: yes *[ja]*
T: OK

Whether Peter volunteers in order to improve Tom's impression of him is pure speculation. However, Tom makes use of the opportunity and upgrades Peter's privileges so that he is made teacher's assistant with the right to create and run conferences. He is also aware of Peter's recent history of endorsing violent descriptions:

T: Yeah, you want to run one of them?
Peter: Yeah
T: Then you'll have to sort of start to provoke a few around here, so …
Peter: Yeah
T: …but just keep it, eh… down to.. yeah, well. ((*softly*)) So you like Quentin, do you?
Peter: Yeh
((*pause*))
T: Which one? Would you like to create a new one, or… do you like to run one of these, of these…
Peter: Ehm… do I have to choose one of them?
T: No. No you don't, you can, eh… I'll just, eh…I'll just put you up here as a, as a teacher's assistant and then you can, eh… create topics and edit, edit topics. I'll just have to wait for the site to load here… it's taking pretty much time…. just log on to *NiceNet* and then call, call me

The softly spoken reference to Tarantino is a move from the teacher's to the learner's script, thereby acknowledging Peter's lifeworld. Peter, on the other hand seems to offer to enter the teacher's script by volunteering to start a conference topic and it results in the following posting on *NiceNet* (original layout preserved):

Conferencing Topic: Take responsibility!!!

[Post Message to "Take responsibility!!!" | Create New Topic]

- **Date Limit:** View All Go
- **Message Layout:** View Summaries Only | Print View
- **Sort Order:** Newest on Top

FROM: Peter (01/23/01 2:49 AM GMT -06:00)
SUBJECT: Take control of your life!
[Reply | Send a personal message to Peter]

People often take the easy way out by giving their responsibility to others. In school, at home, etc. For example: If you get a bad grade at school, the easy way out is to blame it on the teacher. Is this the right thing to do? No! Take control of you own life!!!

Peter does not abuse his newfound autonomous power but posts a straightforward initial message. The result is 13 replies, most of them seriously discussing the point, a few just joking or trying to ridicule others, only one is off target. Peter does not make a second appearance and he does not moderate or activate the proceedings in any way.

Two other learners (girls) also take the opportunity to create new conferences (football, partying) during this session. One of them posts a follow-up to the initial message. There is no sign of them moderating or activating their conference. However they trigger a number of responses from others, five in one conference and 21 in the other. An overview of the *NiceNet* conferencing pattern after two sessions, January 9 (not taped) and January 23, gives the following picture (Table 6.5 below):

Table 6.5 Overview of conferences and interaction patterns, January 2001
L = learner, T = teacher, H = 'Haifaiv', I = initiative, first posting R = response. Percentages in the bottom row indicate the relative frequency of one particular interaction pattern

Conference title (spelling as in original)	I	R to I	R to R	Off topic
Surveillance society?	L	2		
Take responsibility!	L	5	7	1
Party!	L	4	1	
Science Fiction	L	1	2	
Fotball[152]	L	8	10	3
Love and marriage	T	1	2	
How to make it last	T	21	11	1
Psychos killed young kids	T	16	5	1
Halloween – Norwegians got it all wrong!	T	1		
Sport is a waste of time	T	8		
Parents just keep nagging	T	16	11	
It's so stupid that 15 year olds can practice driving	T	7		
Clean World saves the future	T	3	11	
Luis Figo 500 000 000 Nkr	T	10	4	
It's too easy to get off the hook when you've broken the law	T	11	5	
Surfing is a waste of time	T	8		
Most parents don't have a clue	T	7	2	
The weather's fine!	T	10	2	
I got socks for Christmas!	T	7	5	
You think your especial!!!	H	4	2	
Total	L: 5 T:14 H: 1	149 = 63,7%	80 = 34,2%	5 = 2,1%

The quantity may not be the main concern here. However, what is illustrated is a communicative practice in which learners have the opportunity to become empowered in ways that were earlier reserved for editors, publishers, media hosts and teachers. Through exploiting the particular affordances of the artifacts learners could find themselves in a position similar to a teacher's: now *they* can orchestrate the course of events. However, this does not happen automatically or to a great extent. The figures presented in Table 6.5 (above) show that most conferences are teacher initiated and that most entries are responses to the

[152] The initial posting was in Norwegian, all follow-ups were in English

initial posting. Still, there are enough variations to see that the IRF model is less dominating than in the face-to-face setting.

However, a marked shift in learner roles *cannot be expected to happen* as a result of the affordances of the artifact alone. While learners have been scaffolded through the more technical challenges of being a discussion operator and advised as to how to begin, they lack support for true agency, for turning an online environment into a setting conducive to meaningful interaction, for creating insights. This is simply not part of their cultures-of-use in school, although they may have ample experience from taking part in e.g. out-of-school online chats. What should ideally be learners' autonomous power, yielded and supported by the teacher is closer to a case of abdicated power; the teacher is unable to fill the power vacuum with scaffolding the learner's immediate development, a phenomenon also observed by other researchers (Tella, 1991; Warschauer, 1999). Tom is aware of this, and addresses the issue on several occasions[153]. A recurring point is Tom's encouragement to have learners share information and react to each other's postings. Sometimes they succeed as when learners collaborate on *NiceNet* by jointly constructing a long list of items that are typical of either the UK or the US (cf Table 6.1, session 4c). Sometimes they depend primarily on the teacher's initial posting (63,7% of the responses), sometimes learner interaction dominate, e.g. in the conference on 'Clean World saves the future' (cf Table 6.5).

Also, just like the teacher is working at the interface of two systems, so are learners. The realignment of roles and the possible learner empowerment represent a different type of practice than the one that learners historically have been enculturated in. Textbooks, curriculum, school and classroom architecture along with educational discourse have all provided a particular enculturation for learners. When ICTs are introduced, they do not automatically lend themselves to the same enculturation processes. Through their genotype and phenotype qualities they have the potential of undermining certain well-established practices, but they do not *automatically* lend themselves to the practices Tom would like to see. The situation might seem to benefit from the type of relational didactics advocated by Anne Edwards (2002, cf Chapter 3.11) with its emphasis on acknowledging *the other*.

In the last of the observed sessions (cf session 7 in Table 6.1), when planning a project involving an email exchange with South Africa, Tom's view of learners' roles becomes explicit. After first having envisioned a particular division of labor and a joint website to serve the future project, he summarizes,

> (…) but the whole point is to, to make some <u>real</u> group work happen where they, in fact, will have to discuss some strategy, then go out and do things, get together and discuss what they have got, and then make it visible in the product (my translation).

This is a view that explicitly frames the learner in the position of the empowered participant engaged in the joint construction of knowledge, in authentic discourse, and in constructing artifacts. It is a perspective that is essentially sociocultural, but which does not easily materialize in a traditional school context. It should not come as a surprise that the project referred to above never took off as the organizational constraints proved to be insurmountable. However, with all the transnational projects happening in schools, it seems obvious that certain practices are presently pushing against such organizational constraints. When activities at Minerva Senior High are examined (cf Chapter 6.9.4 below) we will see

[153] At Minerva school, teacher Marie expresses similar concern over what she feels is a passive role, cf. Chapter 5.9.3

how this school approached an even more ambitious arrangement involving learners in the US and Norway.

6.6.2. Learner interactions

Early on in the sessions with Tom and class it becomes apparent that activities are 'layered', i.e. there are simultaneous activities going on as illustrated in Figure 6.1 (cf Chapter 6.2). Some are initiated by Tom, some by learners, some originate from the affordances in the setting. There are activities that directly engage learner(s) and teacher (e.g. IRF exchanges), there are activities that indirectly engage learner(s) and teachers (Tom's use of artifacts), there are activities that engage learner(s) and technologies (conferencing, web searches), and there are activities in which learners interact with each other (peer assistance). The first two have been discussed above, while the latter two will be pursued in the following.

Although the lay-out of the computer room affords one PC per learner, learners frequently make quick consultations with each other. Usually this is directed at the neighboring classmates on either side, but often learners cross the room in order to consult others. From a researcher's point of view, it was interesting to note that this activity seemed to go largely unnoticed by the teacher, something he later verified. (A similar pattern was found at Minerva school). Consequently, it becomes of interest to see what kind of activity that was enacted and the frequency of it. Learners' immediate explanation of such activities or direct recording of them went into the data from these sessions. The following view is typical (R = Researcher, L = Lilja, F = Firas, my translation):

> R: Can you briefly tell me what you did over there? ((*at Firas' place*))
> L: We were just trying to find a word that should, like, find a place under, because one was, like, a bit on the side…
> R: The margins were uneven?
> L: Yes
> R: A technical problem, this one then?
> L: Yes
> R: Word Processing?
> L: Mhm
> R: OK. What's his name?
> L: Firas
> R: Did you solve the problem?
> L: He solved the problem, yes, he… ((*laughs*))
> R: OK. But you helped him?
> L: I was going to but I did not manage
> R: Uh-uh. Did he ask for your help?
> L: Er, yes
> R: Does that happen often?
> L: Yeah, we're usually helping each other, like…
> R: OK. Does that go for you and Firas only, or more of you?
> L: That goes for more, really, nearly everyone here helps each other if there is anything that's wrong, or…
> R: Does this apply to technical problems only or does this apply to the English tasks as well?
> L: It goes for everything
> R: It goes for everything?
> L: Yes
> R: But the teacher, you don't need him then?
> L: He… if there are things the others can't help us with we ask the teacher
> R: So he is second choice?
> L: Yes ((*laughs*))

It became evident that widespread collaboration took place, but that much of it escaped the teacher. One such pattern that materializes is expressed by Ivar (= I) and his neighboring classmate (my translation):

> R: If you wonder about something, who do you first turn to for help, classmates, teacher or the software?
> I: First, my neighbor, then the software
> R: OK, is that typical for the lab or do you do that in [ordinary] class as well?
> I: No… we collaborate in the classroom too? ((*looking towards neighbor*))
> Neighbor: In class…yes
> R: Just you two, on the whole, or more?
> I: No. Just the two of us. We are regulars, we're a team

Approximately 10 learners were asked the same questions and it resulted in nearly identical replies; first choice is the classmate(s), second choice is a draw between teacher and technology. The content of peer-to-peer consultations varies. Mostly they address language problems, particularly spelling and vocabulary, but learners were also taped discussing how to use the dramatic present tense in order to heighten the suspense in a creative writing task (before finally consulting Tom). Several learners also discussed how to merge two complex plots into a multi-layered text when writing about a confrontation between environmentalists and motorists. Some learners developed plots and twists that included themselves and classmates, like when Ivar, excitedly turns to his neighbor, saying "You are in the car in front of me!", hence inviting his neighbor into co-authoring a story in which they both act out dramatized roles. Consultations on technical matters like graphics, layout and use of search engines were comparatively rare. Boys with advanced ICT proficiency were sometimes consulted, but mostly these learners liked to discuss security measures, file allocation, HTML and cutting edge technologies with Tom. This usually happened at the end of a session or during the break as if it were implicitly understood as an off-task activity. This group of boys evidently enjoyed this little ritual. Regarding technologies, the group obviously represented a highly sophisticated 'culture-of-use'. They constituted a resource that might have been cultivated and exploited beyond the roles they assumed in a school setting.

Peer-to-peer episodes like the ones referred to above are many and of different types. They are elusive in the sense that they pass quickly and do not leave tracks, but the high number of such instances point to learners taking on supporting roles much like teachers. These interactions represent a resource in the sense that they may complement teacher's instruction, scaffolding and guidance. They also show that the distribution of labor is not just negotiated on a teacher – learner level, but that there are several layers of goal-directed work.

A related phenomenon and in the form of another layer is learners interacting with technologies in order to obtain help. Whether it is targeting information, developing a more precise and varied vocabulary or proofreading texts the class has a tool a keystroke away. Some of the learners demonstrate extraordinary technique; one boy is using the proofreader to target words where letters *c* or *s* might be hard to decide as being the correct spelling, e.g. *coincidence*. Others are efficiently using the bilingual dictionary or search engines. However, there are also those who demonstrate a certain helplessness, usually a result of inaccurate spelling (essential when using *WordFinder* and searching the net) or failure to understand when the spellchecker suggests a wrong word because the learner's entry is closer to the spelling of this word. Such lack of conceptual appropriation of the tools makes some learners resign and refer to the technology as "stupid".

In October, Tom led the class through search strategies on the net. Learner Ole says this knowledge is what he is using when observed during the following sequence. As part of his tourist brochure on London (cf session 3b in Table 6.1), he wants to include some authentic accommodation possibilities (my translation):

R: Can you briefly tell me what you are doing right now?
O: Now I'm about to make a search for Mohammed al Fayed….
((*Ole uses Alta Vista with the following string:* `+"mohammed al fayed" +harrods +hotel –princess –Diana`[154] *The search results in a list of hits*))
O: Here: you can see names of hotels
R: Yes
O: And I didn't remember the name of Harrods]
R: [OK
O: [in London
R: So then you entered *Alta Vista* to search for]
O: [then I used his whole name inside speech marks
R: How did you come to know that particular name, Mohammad al Fayed?
O: I ((*laughs*)) got it from TV
(…)
R: But there ((*pointing to screen*)) you have a fairly advanced search that gave exactly what you were looking for
R: Yep!
R: And you are going to make use of this?
O: I'm going to use some of it, at least.
(…)
R: Do you use… do you get anybody to help you, say classmates, teacher and software you've got here, *WordFinder*…
O: Yes, I make use of *WordFinder* quite a lot.
R: What's the first thing you do if you're stuck for a word… do you ask your classmates or do you use *WordFinder*?
O: Use *WordFinder*
R: That's number one?
O: Yeah
R: Number two?
O: I ask Tom or go to the neighbor

Ole's procedure exemplifies two aspects of the learner's role in networked environments. The first has to do with a literacy that is based on connecting bits and pieces of information in a particular algorithm in order to produce a result. The mediating technologies are abundant: the PC, the network, the search engine, the database from which the information is retrieved, the digitized representation in the form of HTML, XML, java etc. etc. Some of these technologies are operated directly by Ole, while some work invisible to him until the result materializes on his screen. With his digital literacy Ole has appropriated an ensemble of ICTs so that he can set them to work for his current task. The second aspect touches upon Ole's trajectory and his 'culture-of-use'. In his algorithm, Ole draws on resources provided in the EFL sessions, but he also targets information he does not have (hotel name) in a roundabout way (al Fayed etc.) by drawing on a recent out-of-school experience (watching TV). In the last part of the exchange, Ole shows how technology, peers and expert together form a helpdesk.

[154] This fairly advanced algorithm tells the search engine to look for the words within speech marks as one unit, the plus sign, +, equals a required item while the minus sign, –, requires that this particular item must not occur in the information he seeks.

Numerous examples, however rarely with such sophisticated algorithms, are found in the sessions observed. Together they point towards the notion of *agency*; empowerment resulting in the ability to carry out goal-directed actions and observe their consequences, just like Ole in the above example shapes his immediate learning environment. Agency is seen as a central objective in computer assisted language learning (Kern & Warschauer, 2000; Warschauer, 2000a) as well as the multiliteracies addressed by The New London Group (Cope & Kalantzis, 2000). However, such agency comes at a price. Learners who fail in targeting relevant information, who do not make sense of linguistically oriented software, or who have difficulties in moderating an online discussion indicate that for learners, like teachers, ICTs must be situated; implementation must occur as part of the disciplinary *and* social context. That learners in the foundation course in Norway receive a general introduction to ICTs as a separate subject is no guarantee for transferring these skills to other contexts. The particular school subject and the context in which it is learned clearly influence the appropriation processes involved. However, if ICTs are to be embedded in the separate school subjects, this (as we have seen) transforms and might displace and even supplant activities that teachers have honored through years of practice. Consequently, the role of the subject must be examined.

6.7. Role of school subject

Chapter 3 showed how changes in the English language, mediating technologies, and didactic approaches require a multiliteracy that is broader and more complex than what has traditionally been associated with reading and writing. Such a multiliteracy lens is necessary if we are to make sense of how EFL manifests itself in the ICT-rich school context. Changes can, on the one hand, easily be mistaken for a 'disciplinary loss' of time-honored skills; on the other, they challenge participants as to what should be seen as practices conducive to fostering relevant insights. Some of the issues that might illustrate this dilemma follow below.

Firstly, as was discussed in Chapter 3.3, the English language is in flux as a result of globalization and the impact of technologically mediated language practices. The combined effects of these influences change the status of the school subject as teachers have come to regard it through years of practice. However, with the innate inertia that characterizes curriculum and exam reform it may take time for such a change to materialize in institutional discourse, e.g. curricula and exams.

Secondly, when didactic perspectives become linked to the theoretical perspective of learning as participation, emphasis is placed more on the practices in which the subject discipline, EFL, can evolve than on the acquisition of it. The former primarily targets social use, the latter emphasizes knowledge as a mental capacity, and knowledge as a cognitive property may not be compatible with the participation metaphor (Sfard, 1998). According to Claire Kramsch and Steven L. Thorne, building on numerous studies,

> *network technologies have helped to initiate a significant pedagogical shift, moving many language arts educators from cognitivist assumptions about language and learning as a brain phenomenon, to contextual, collaborative, and social-interactive approaches to language development and activity(…) (Kramsch & Thorne, 2001:86).*

What we see are the epistemological changes that were discussed in Chapter 2.2.7.

Thirdly, the subject (EFL) is transformed under the practices that involve new technologies, new literacies and a division of labor that is alien to traditional practices. During the sessions that were taped for this study, it is rare to see the subject explicitly "taught" except in brief

moments of individual scaffolding. Domain specific knowledge may seem to be lacking or playing a minor role. An example may illustrate this:

In the episode displayed in Table 6.4, the column devoted to the teacher as a subject authority was seen to be unfavorably balanced with e.g. user support. However, it is not untypical of the ICT-intensive sessions observed and taped. One reason is that ICT-rich environments are not only mediating our learning and teaching efforts; as we have seen they carry inherent properties that transform them. Sometimes transformation appears in the form of activities that may not seem to have a direct bearing on the school subject. For instance, learners spend quite some time on exploring and exploiting the aesthetics and manipulative power offered by the software, using material made by others, experimenting with color, fonts, backgrounds, layout and also HTML code to add a personal touch, to place hyperlinks etc. Text becomes embedded in visual dimensions of communication, pointing to an extended notion of literacy. Sometimes the technology itself occupies the horizon like when Tom must spend quite some time on taking learners through the algorithms of web searches, the (technical) use of the bilingual dictionary *WordFinder*, helping out with a website that does not load and a printer crash. Bødtker (1996:150) has addressed such issues in terms of *focus shifts* and *breakdowns*. While the former might in fact be serendipitous moments and opportunities for learning afforded by the environment, the latter is a constant threat to a disciplinary-oriented practice where covering the curriculum and passing the exam are the benchmarks of success.

Teachers who approach EFL and ICTs may find themselves apprehensive as they realize that the ICT-mediated practices they find themselves in are not necessarily compatible with such goals. The purpose of their activity, bringing learners to a curriculum-defined level of proficiency, no longer seems to be fixed, tangible, and measurable. Where a subject could be framed according to curricular standards, it has become a slippery bar of soap[155] that dodges the teacher's attempts at grasping it. Clearly delimited knowledge domains may seem to have a tendency to "blur" or even "disappear" in the technology-infused classroom, a phenomenon also addressed by researchers (Ludvigsen, Rasmussen, & Arnseth, 2002).

The answer from a sociocultural point of view may be to view the ability to *participate* in a disciplinary discourse community as the benchmark for mastering a particular knowledge domain. A school subject is constituted through the activities in which it is entrenched but when activities change, so does the school subject. When the collective efforts of class 1aac during the taped sessions are analyzed, what seems to be a minimal focus on EFL-related issues is descriptive of learner-teacher relations but not when the totality of the interactional pattern is considered. The logs document a considerable production of EFL in the conferences, the layers of consultations referred to above are many and goal-directed, new literacy practices are abundant as learners and teachers appropriate the ways ICTs and EFL dialectically produce e.g. new genres and phatic modes. However, the object of the activities, proficiency in English, is not *given* under such circumstances, i.e. it is not handed over from a textbook or worksheet. The object *emerges* as learners bring their own trajectories into the interactions (the numerous conferences illustrate this as does e.g. Ole's use of the search facility). What is more, the object is not identical for learners and teacher. As the examples from class 1aac indicate, learners draw on their lifeworlds as they negotiate and construct views on *Relationships*, *Taking responsibility*, *Leniency and juvenile crime* (cf Table 6.5), and a number of other conference topics. But no technology (at least used in this class) can provide the in-depth dimension needed to become a master in the knowledge domain. There is

[155] This particular metaphor is not accidental but has been used both by teachers in the present study and in discussion between researcher Leif Martin Hogstad and the present researcher when trying to understand the phenomenon of the 'classic' EFL discipline fading into the background.

a very clear difference between partaking and informed, meaningful, and proficient participation. While ICTs obviously afford a repertoire of participation practices and seem to be conducive to a larger volume in production, they cannot on their own generate "social practice in its 'mature' form" (Lankshear et al., 2000:145).

The present study argues that the tension between two activity systems impede teachers' appropriation of ICTs. If changing practices are to be sustained, institutional support is needed on several levels, not least in exams that afford the practices we see emerge in technology-rich environments. Exams may be seen as an encapsulated form of the socio-politically authorized concept of a school discipline; in sum and in practice exams define a subject and the goals attached to it with more credence than the curriculum. Therefore, interactional studies of Teacher(s) ↔ Learner(s) ↔ ICT(s) are not complete without taking the influence of this most relevant contextual factor into consideration. However, most interaction studies of this kind are curiously uncommunicative on this highly influential issue[156]. The backwash effect of exams can hardly be overestimated and serves as a litmus test as to what proficiency in EFL means. The exam as an artifact carries expectations of accumulated human knowledge and a particular domain knowledge perspective; it mediates and influences certain practices more than any other artifact. If the nature of the exam is contrary to the practices we see emerging in ICT-rich environments, this precarious ecology is not only disrupted, it is in conflict with itself - an educational House of Usher.

This is one reason why the teacher is more important than ever when ICTs make their way into classrooms. Expertise is needed, but this kind of expertise is 1) difficult to define, and 2) may not be institutionally supported. Durant and Green address these issues in their description of the teaching profession:

> *it puts education firmly up front, and that means emphasizing literacy and curriculum issues in the classroom and in one's teaching rather than technology or technical issues. In such a view, the latter is always secondary, or* supplementary*, although importantly never neutral. Technologies* support *learning and teaching, which always remains the main game, and indeed the point of the whole exercise. Hence it is a teacher's* educational *expertise that needs to be foregrounded and strengthened, along with their professional knowledge, skills and dispositions, which they then bring to bear on the challenge of new technologies for schooling and for education more generally. Among other things, this restores the role and the significance of good teaching, and of the teacher as 'expert' in his or her own classroom, charged with drawing children into the culture of learning.*
>
> *Integrating Information Technology into the Key Learning Areas always, and of necessity, involves drawing on the specific subject-area expertise of teachers. Similarly, constructing coherent, informed, effective literacy programs requires that teachers' professional judgment and their own theories of literacy and pedagogy become crucial, first-order resources for curriculum and professional development. Policy-wise, it follows that strategic alliances need to be forged, within schools, between different but related communities of interest and expertise, and new opportunities generated for across-the-curriculum professional dialogue (Durrant, (1998) cited in (Lankshear et al., 2000:144), emphasis in original).*

Tom was chosen not only for his repertoire of designs but also because he is in a position to illustrate how the social practice of exams can change with the appropriation of ICTs and, consequently, support and sustain these processes. An attempt at institutional support on examination level is found in the new style exams that a group of teachers, including Tom, are

[156] On a more general level researchers have pointed to a mismatch between potential technology use and curricular affordances: "If there is a poor fit between what a new innovation can offer and the curriculum already in place, the technology is doomed to failure – if continuing use by teachers counts as success" (Garner & Gillingham, 1996:11).

involved in designing (under the auspices of *The Norwegian Board of Education*, and which is at the time of writing still ongoing).

Without going into the history and the numerous twists and turns this project has taken, it is important to note that,

- English is one of several school subjects taking part in the project (Math, Social Science, Law, Electronics etc.)
- The form of the exam must accommodate upscaling from the few project classes to national level
- Teachers and learners involved will throughout the year experience two term tests that are designed to the same principles as the final exam
- The format will require the use of ICTs as well as a phase of collaborative work followed by an individual test

Within this framework, the designs have changed over time. For instance, at first the time for collaboration in the EFL exam was set to 24 hours while at the time of writing it has increased to a period of one week. During this week learners are to acquaint themselves with a given topic and discuss certain aspects connected with this topic as indicated on a task sheet handed out (cf example in Appendix 3). Discussion could engage learners from the other project schools by using an online message board[157]. The intended domain-specific discourse and the jointly constructed insights can then be exploited by learners during the individual test (cf example in Appendix 4). The time allocated for the individual test is five hours. Learners may use every kind of artifact during the individual phase except that the Internet is shut down[158]. In the following, we will observe preparations for a term test as described above. In Table 6.1 in Chapter 6.3.2 these preparations are listed as item number 7.

On April 18, the first school day after the Easter holidays and the last day of classroom observation in 1aac, the second term test (cf Appendices 3 and 4[159]) is introduced (the first

[157] Data from these discussions were not available to the present researcher.

[158] This has been a topic of some discussion. On the one hand it violates the authenticity of the exam situation. On the other, most schools do not have the expertise to keep an outsider, e.g. a friend majoring in English to electronically substitute a learner's product with her own. As the legitimacy of this type of exam is of great concern (the skeptics are many), the Internet is presently not an option during the individual phase of the exam.

[159] Some of the information is in Norwegian. In the text for the *preparation period* there is a comment on the use of people and materials (my translation),

> *In the preparation period all kinds of help are allowed. During the English lessons and during ordinary school hours you will have access to a networked PC.*
>
> *Also, during the [individual] all-day test all kinds of help are allowed except communicating with others.*
>
> *Information you obtain during the preparation period will become useful during the [individual] all-day test.*
>
> *To gather relevant information in order to wisely utilize it later in your own product is an important part of the competence described in the curriculum (p2).*

In the text for the *individual exam* the evaluation criteria state,

> *It is the general impression of your response that is evaluated. The examiner will credit use of relevant subject knowledge, coherence, and concise and varied language. Moreover, the examiner will credit responses that are creative, and that show ability to exploit the potential in the language (p2)*

and,

one took place right before Christmas), and from now on learners are to prepare before they have to sit for the individual test. The episode that unfolds (taken from session 7 in Table 6.1) around the introduction of the topic commences on the following note:

> Tom: (…) ah, you remember the date ((*writing on blackboard*)) April 27, that is the date of the term test, and it's closing in. Actually, we, sort of, have to start preparing anyway, and you remember from last time that we had a pretty long period of preparation (…) I would now like to introduce the subject. And you will probably feel… a little bit scared right away, but then it will… when you start to think about certain aspects or certain things you will see that, well, there's a lot to write about, to discuss here. Hm. I will just hand out, eh, a preparation, ehm, part here, you can study it for some minutes and then I will, eh, I will give you some, eh, some introduction. OK. Here it comes: The topic is "The American Idea of Freedom"

Tom hands out the assignment for the preparation period. Initial learner responses are as follows:

> Ls: ((*fairly subdued reaction, one voice says "yes!", lots of small talk*))
> T: Now you panic!
> Ls: ((*More small talk and comments*))
> T: Are you positive again?
> Ls Yeh
> T: You've been that all year

Immediately, a process in the form of collective brainstorming begins. It is supported by the task sheet for the preparation period with its suggestions on how to work and a URL that takes learners to Tom's website and links relevant to the topic. On Tom's website, there is also a link to a message board set up for class 1aac and the other classes that are involved in the new style exam project.

> T: Just discuss in between you, a minute or two ((*pause, sounds of Ls talking on topic. T to himself:*)) OK. Oh Yeah! ((*pause*)) OK! What is 'freedom'? ((*3 sec, no response*)) What, what sort of freedom are we talking about? ((*5 sec, no response*)). Mention some sorts of freedom, the freedom to… Alex?
> Alex: To say what you want.
> T: Yes! The freedom of speech, that's very important. ((*another L signals*)) Yes?
> L2: The freedom to bear arms
> T: The freedom to carry a gun… even an assault gun. Other freedoms? ((*a third L signals*)) Yeah?
> L3: Freedom to write
> T: Freedom of expression, the freedom to write. Certainly

Such exchanges in the IRF format go on and develop via views on laws and regulations on handguns, drug use, polluting the environment, and age limits for a driver's license to the Statue of Liberty, the French slogan for the Revolution – Freedom, Equality, Fraternity – and US immigration. Tom draws on his background as a teacher of History and gives a mini-talk on the 'Rags-to-Riches' philosophy and its legitimacy, oppression caused by poverty, the American Constitution etc.

The next episode turns from subject matter to strategies:

> T: Now, in this period, up to the 27th you will gather as much information as possible and discuss the topic, like we've been doing now. You are free to… use other persons, that you

---

When the examiner evaluates your response she or he will check that you support your claims and that you can give relevant examples. You will be credited for in-depth answers. Express yourself in a clear and concise manner (p3).

know, your uncle, your aunt, eh, your big brother, you're free to use the library, Internet, you are free to use the message board. In fact you're, we want you to use the message board.
L: No doubt it will just be bullshit, like the last time *[Det blir sikkert bare kødd, sånn som forrige gang]*
T: Well, eh, hehe, we can get back to that, but some, some sent stupid messages, but they were by far outnumbered by the serious ones. Hm. But that's up to you, isn't it? This is, eh, this is what you create, what you make out of it. You can eh… ask me for a lecture on the topic, if you want to. You can eh, well, discuss in groups, study on your own, of course some things are more sensible to do than others. Hm. On page three, we have listed some topics which we suggest, ah, we think that these are very central when it comes to the American idea of freedom

It appears the first term test with its topic of *Science Fiction* had turned out well, but that learners were unaccustomed to the format. Also, some expressed disappointment with the online message board as it produced much off-target activity. This is an echo of learners failing to fully appropriate the *NiceNet* conference as moderators (cf Chapter 6.6 on Learner roles).

The rest of this term test session is devoted to learners slowly getting into preparations, starting to ask Tom for advice, mostly concerning interpretation of the task. This may be understandable considering the intentionally broadly formulated instruction of "Do research into some aspects of the American society" followed by a few suggested areas. Tom is also asked to give a mini-lecture on the topic in the days before the individual test, something he readily agrees to do.

The individual test is designed so as to avoid reproduction but rather encourage autonomous and critical thinking. The task formulation says: **"**Read the excerpt from President Bush' [sic] inaugural speech below. Choose one aspect of American society and discuss whether what he says about freedom is true or not". The instructions also remind learners that they are to make use of the research they have carried out during the preparation period.

With the new style term tests and exam, a crucial element in the learning environment has changed. Technologies have become embedded in an activity system in which the school subject with its accompanying testing ground accommodates the potential of these technologies. The school subject in its encapsulated form of a new style exam paper bridges the distance between classroom practices struggling to implement ICTs and the institutional, cultural-historical idea of education. The exam, in fact, serves to coordinate and communicate perspectives from these two camps. As such, it can be viewed as a *boundary object* (Star, 1989); it is flexible enough to allow for local adaptation and the needs of people involved while at the same time it is robust enough to provide support and constitutes a coherent whole. In the case of the new style exam, it is open to diverse learner interpretations and responses, while as a *National Board of Examination* document it will carry robust authority and support the transformation of practices in the ICT-infused EFL classroom. Further studies into exam designs as boundary objects are highly relevant when studying how educational communities appropriate ICTs, but this line of research is beyond the scope of the present study.

To the present researcher, Tom's involvement in new style exams is a typical example of 'what might be'. The tensions between a traditional discourse and the wish to develop new practices lead to a reconceptualizing of the exam, i.e. it is transformed into a richer repository of possibilities that transcend the goals associated with 'school subject' and 'school knowledge' (cf Chapters 3.9.5 and 3.9.6). Such transformation is necessary if ICTs are to be culturally appropriated and not only used instrumentally. Lim Cher Ping addresses similar concerns in his study of how the object of an activity system (e.g. exams, scores, results) constrains the use of ICTs:

> *As long as the bottom line hinges on examination results, many of the cognitive opportunities of ICT in education will not be perceived. Even if teachers are made aware of these opportunities through professional development workshops, perceived opportunities that do not fit into the object are unlikely to be taken up; and hence, the object of the activity system becomes a major barrier to the creative use of ICT (Ping, 2001:9).*

And Ping goes on to signal "an urgent need for a shift of the object of the activity systems from one that honors examination grades to one that promotes lifelong learning" (op.cit.:9). While the repercussions of this view are considerable, the new style exams that Tom takes part in designing seem to meet at least some of Ping's intentions, e.g. more cognitive opportunities and a marked step towards collaborative procedures that point towards lifelong learning.

6.8. Mercator: final comments

While the preceding pages have been addressing designs, roles, and scripts it should be noted that these are by no means seen as static but as continuously reconfigured through dialogue and negotiation. As the sessions from Mercator indicate, both teachers, learners and technologies commute between positions that are not dichotomously locked in a teach/learn position, but rather appear as temporary positions on a scale of dimensions. These dimensions involve various degrees of empowerment, agency, and multiliteracy, but they are not self-sustainable. They need to be fed by a relational agency in which the teacher is the primary resource.

The activity system that emerges seems to have the potential of empowering learners as co-designers and co-orchestrators. However, this empowerment is not achieved by focusing on being technologically savvy, but by sensitizing teachers and learners as to how they position themselves and interact around a certain discipline, a series of designs and tasks, and the technologies involved. To develop teachers' ability to consciously address zones of proximal development in these designs seems to be a relevant goal for teacher education as well as in-service training. Crucial elements in these processes are teacher expertise and boundary objects that represent institutional rigor but allows for flexible implementation. Such questions of zones of development and teacher expertise in ICT-rich environments will be pursued in Chapter 6.10, after a study of a second, somewhat different information ecology.

6.9. Minerva Upper Secondary School

> *The "same technology" is* not *the same in different classrooms*
> *(Garner & Gillingham, 1996:7, emphasis ion the original)*

Minerva Upper Secondary School is a fairly new school. From its origins as an affiliation to a larger school in the neighboring town, Minerva became an independent school with new premises in 1986. It is located inland from a coastal township of approximately 20.000 inhabitants. The area traditionally thrived on fishing and small-scale farming but during the 1970s it was heavily industrialized, boosting the number of people in the area and changing the socio-economic structure with the arrival of industrial workers, engineers, managers and service industries. The area also provides a rich out-door life, beaches and fishing, and entertains quite a lot of tourists during the summer months.

Today Minerva serves approximately 450 learners with 380 learners in the General area of study and the rest in the Health Care area of study. The close to 50 teachers, near two thirds of them female, have an average age close to the national average for teachers at the time of the

present study, approximately 50. The school atmosphere is characterized as 'intimate, pleasant, and stable' by the two teachers, Helen and Marie, who agreed to let the present researcher into their classes. Historically, the school has not been a pioneer in ICT implementation, but there has been continuous administrative support regarding purchase of equipment and ICT-training for teachers. Management level has, based on staff needs and requirements, provided courses, hardware and opportunities for learning. Whereas many Norwegian schools are at the mercy of one or a few enthusiasts who promote the use of technology (Erstad & Trandheim Røn, 1998, cf the history of Mercator), Minerva is characterized by groups of teachers who jointly try to implement technology in their subjects and activities. Teachers of economics were the pioneers, but a project on differentiated learning also paved the way for technology finding its way into other subjects.

The school is one of the few that allotted participants in *The Tower* time to work on lessons and tasks during their work at school, something that seems to have been a decisive factor regarding completion of the course and profitability for the participants (cf Chapter 5.4.2). Six teachers of EFL signed up for the course and they all completed, working as a group. Also, the group at Minerva was active in designing ICT-infused lessons and projects, resulting in a project on nutrition which was used as an example of good practice in *The Tower*.

6.9.1. Teachers: Helen and Marie

Two teachers at Minerva were subject to observation; Helen and Marie. Helen started out using ICTs for administrative purposes at a school in the neighboring area. When she later, working at Minerva, signed up for *The Tower*, she had the basic instrumental skills. With her 45 years, she is somewhat younger than the average high school teacher and the average age of *The Tower* sample. She states that the most important reason for implementing ICT in EFL is "added value". She will only learn a specific skill if it serves a pedagogic purpose: "I do not go for the 'playful attitude', that's for men"[160]. For example, when she discovered a pile of old emigrant letters from family members who settled in the US, she saw the need for email as a means of turning this into an opportunity for project work involving St. Sunniva College in Minnesota (known for its close ties with Norwegian heritage) and her own school. Also, she learns a lot from her pupils, she says. Helen states that ICTs are motivating for pupils, "the weaker ones as well", and that she is fascinated by the possibilities of transcending boundaries of cultures and geography. While quite a lot of teachers experience a tension between the syllabus with its goals and the use of ICTs, Helen expresses little fear of not 'covering the curriculum', with the notable exception of an ambitious exchange project (see below).

Marie claims to be a novice regarding technology. Her reasons for taking up ICTs in EFL are partly an attitude she articulates as "I refuse to expire like a date stamp" (she is 60), partly a wish to team up with Helen in the exchange project (see below) because it represents an opportunity to learn and because the project is tempting in its potential and scope. With her long career in teaching, it is interesting to see how the potentially transformative qualities of ICTs would be appropriated or whether ICTs would be seen as enhancing existing practices. Important to Marie is cultural knowledge, history and facts – "a bit too much!" – and she wonders whether ICTs might supplant content[161]. She admits to some skepticism but is open to revise this attitude. In sum, her attitude might be described as somewhat reluctant

[160] The present researcher was somewhat amused at hearing this as this observation is, in fact, quite characteristic of her colleague Tom. However, Helen had no knowledge of or information about his practices.
[161] Cf Chapter 6.7 and the role of the school subject. Marie's concern is in many ways an echo of 'the slippery bar of soap' that was used about the changing manifestation of the school subject.

participation, albeit mostly intrinsically motivated. During the time of observation Marie's commitment to the use of ICTs seemed to increase.

Helen and Marie also share a concern for their learners to use English only in class. Both admit to exercising some authority on the issue. According to one of her learners, "Helen suggested we get a 'red card' every time we speak Norwegian". Marie says, "Oh, I have been extremely strict, fines to paid [when speaking Norwegian] and we have had quite some fun with that, but I have been extremely strict." During the observed sessions, learners as a rule spoke in English, although the subtle peer to peer consultations were held in Norwegian.

Both teachers stress the importance of *The Tower* in bringing about a collaborative spirit and being conducive to learning ICTs in an EFL setting. Judging by the accounts of Helen and Marie, a pervasive collaborative spirit seems to be present at Minerva. Following *The Tower* course, this collaborative spirit materialized in a joint effort by Helen and Marie[162] in bringing about a sustained online exchange with American learners and a series of less ambitious designs.

6.9.2. Observations

Unlike observations at Mercator, which focus intensively on one teacher and one class during most of a term, observations at Minerva focus on two teachers, three classes, and more randomly from September 2001 until May 2002. The classes include a foundation course, taught by Marie, and one second year class (*VKI*) and one third year class (*VKII*) taught by Helen. Also, while several sessions were taped and transcribed, the taped material from the period of observation includes more informal talks and the two teachers' comments before, during, and immediately after class. Hence, the empirical material has a slightly different profile than that collected at Mercator.

It appeared very early on that there were many and fundamental similarities between practices at Mercator and Minerva. However, there are also differences that are important in the sense that the Minerva material reflects aspects that were not so much to the fore at Mercator. In the following, emphasis will be on such aspects. For instance, practices that involve learner presentations and a transnational Internet project are seen as contributing more to our understanding of life in the ICT-rich classroom than corroborating an interpretation of the practices found in Tom's class. Mercator and Minerva may represent two information ecologies and they have different cultural-historical heritages, but they are variations of the same phenomenon. Hence there is no need for a different set of constructs to examine practices at Minerva. No attempt is made at comparing the two schools as to which practices are more 'worthwhile' or 'valuable' than others. Rather, where comparison is made, the aim is to illustrate a repertoire, dimensions of ICT-infused practices with the diversity and complexity involved.

The fact that Helen and Marie operate as a pair is also an interesting difference from Mercator. From their relative positions as experienced user and novice the two teachers engage each other as well as others in their efforts to integrate technologies. Collaboration was found to be a significant factor for *The Tower* participants who completed the course (cf Chapter 5.9.1). Minerva offers a glimpse into collaborative practices as they materialize in an

[162] A third teacher was very much involved in starting up this project. At the time of the present observations she was on leave. Both Helen and Marie refer to her as being very much instrumental in instigating the project.

educational environment that was not planned and organized for such a practice in the first place.

6.9.3. Designs at Minerva

A striking similarity between Mercator and Minerva is the way the three teachers involved in the present study rely on a repertoire of designs. As the textbook and the workbook gradually take a less central role in the sessions, richer, more complex and artifact-intensive designs emerge. For example, Helen, the more ICTs-experienced teacher at Minerva, constantly orchestrates sessions much the way Tom does at Mercator utilizing proactive, indirect modes to great extent while in-session practices are often characterized by direct individual scaffolding, managing serendipitous moments as well as critical ones. A typical example of Helen's approach to teaching would be the following email message, sent from Helen to her class of third year learners (VKII) on 18 September 2001, the day before they join in a double session:

> Hi guys!
>
> I provide today's agenda:
>
> 1) The quia test is named Agenda 19 September (www.quia.com). It is based on current news from the English speaking world.
>
> 2) Work in pairs with the attachment which constitutes the clues assigned to you. Arrange the concepts in a chronological order and perform corrections, alterations (search on the net). This is going to be our fact sheet in order to highlight the impact of Britain's history on English becoming a world language.
>
> The group consisting of Guro, Ada and Guttorm are released to work with the web site.
>
> 3) Look up information on the following organisations. State what their main purpose is and describe Britain's role in them.
>
> EU (Helle and Pamela), OECD (Linn and Tove), UN (Tor and Steinar), NATO (Silje and Vibeke), GATT (Emma and Stine) and the Maastricht Agreement (Thale and Mette).
>
> Mail your replies to me (we will make a new fact sheet).
>
> If you have time left, it is a good idea to write your applications in Word and provide me with a copy.
>
> GOOD LUCK!

The fairly brief message is rich in instructions, suggestions and organizing the division of labor:

Item 1 involves the use of an online quiz ('Quia') in which Helen has utilized a generally available template for her own goals and written a series of questions and tasks to be completed. Consequently, this serves as a collective 'opener' for the English sessions, and with a clear teacher presence, although indirect through the use of the website.

Item 2 is part of a process in which learners construct their own fact sheets on the UK (the graduating VKII course is characterized by emphasis on social issues in and factual

knowledge of the English-speaking world). It is interesting to note the division of labor that frees one group from this task in order to work on a website. This website is the one that serves the transatlantic communication exchange project initiated by Helen (see below).

Item 3 is another variant of gaining insight in social issues relevant to Britain, including an invitation to pool replies into a second fact sheet[163]. The option of writing applications (the overall context is missing in this note) caters to learners who might work fast on the previous assignments.

In sum, during these two sessions ICTs are allotted several functions including providing interactivity (quiz), representing a searchable database (building a fact sheet), representing the class taking part in the exchange project (building a website), communication purposes (email), and the optional activity of writing an application (word processing). Partly, their use is woven into a pre-designed but flexible plan for the day; partly they are used *in situ* according to the needs that arise. As in the case of Tom, ICTs are used in a variety of tasks and assignments, not as add-ons but embedded in the activities designed. This seems to be typical of teachers like Helen and Tom; through practices that reflect cultural appropriation learners, teachers and technology organize themselves around activities that are diverse and dynamic.

Taking a look at Marie's designs, the situation is somewhat different. Commenting upon the above design and the way the sessions ran (Marie was present to assist and learn) Marie thinks that some of the topics were difficult to handle. The net, she feels, provides such an abundance of information that it is hard to make sense of it all and what counts as relevant and high quality material (my translation):

> M: These are not easy topics
> H: No, and these are topics we are dealt ((= *in the curriculum*))
> M: Yes, but I'm thinking, when you have the textbook, then you have, in a way, <u>that</u> to relate to, what's in the book, that is, you can reproduce it and think about it and do some reasoning around it]
> H: [mhm
> M: [but when you're on the net
> H: [mhm
> M: [and search and have <u>all</u> that material to search in
> H: [mhm
> M: [you get pretty much confused

Similar concerns are voiced by Marie on other occasions as well. To her, learners seem to spend more time than strictly necessary on targeting relevant information. Consequently, her designs rely less on searching the net and more on navigating routes prepared by herself and/or suggested URLs in the textbook. With no new-style exam to alleviate the tension between activity systems (cf Chapter 6.7) this dilemma is clearly a constraint on a teacher taking an apprentice position towards ICT discourses. The risks involved in the more complex designs found with Helen and Tom can seem intimidating to a teacher in a novice position.

[163] One noteworthy occurrence resulting from this task illustrates how learners came to know that the GATT (General Agreement on Tariffs and Trade) organization as it was named in their textbook from 1994 had developed into the WTO (World Trade Organization). Both learners and teacher Helen were updated on this issue as well as getting colorful and dramatic actualization through descriptions of WTO protests in Seattle, December 1999, - a case of netsearch serendipity.

Marie also emphasizes "I wish I was more proficient in ICTs!", and expresses admiration for the way Helen designs "such a variety of assignments and competitions".

A typical example of a design in which Marie uses ICTs in a more controllable and clear-cut arrangement is when they are used to extend a basically textbook-driven assignment. Marie's class, a foundation course, has recently read about Winston Churchill and the public school he attended, Harrow. The text book, *Imagine*, comes with suggested URLs to pursue the topic, among them the URL for Harrow[164]. Based on the online material, Marie has made a series of questions and small tasks that require learners to navigate the Harrow website for relevant information. The session devoted to this activity takes place on April 23, 2002 and from the start Marie makes the rounds making sure everybody accesses the correct website (words in italics denote the links navigated):

> M ((*to L*)): You go to *Imagine*… ((*assists L in finding the correct links*)), *Imagine* and then *Videregående skole*, it depends where you are. Up! Then you have to start *Videregående skole*. And then you find *English*, and then *Imagine*, probably. ((*moves on to next L*)) You have made yourself comfortable, have you?

The episode from which this excerpt is taken shows that learners are required to observe directions and follow a track more than exploring nodes of information and the links between them. Consequently, learners make their way to the website in question without much trouble, and start doing the tasks. As the texts on the Harrow public school website offer language of intermediate to advanced level, some learners ask Marie about certain terms like e.g. *dormitory*, *weekly boarders*, and *pastoral care*. Authentic and specialized language use represents a challenge for teachers making use of the Internet and places considerable demands on their subject knowledge in the form of linguistic and sociolinguistic competence. Often, teachers and learners find out by joining efforts in pursuing new lexicogrammatical items they encounter (both Helen and Tom are examples of this). Marie has a slightly different strategy (my translation):

> R: Were you prepared for that one, 'pastoral care', had you already looked at the website?
> M: Yes, and I had gone through all the questions
> (…)
> R: You really have to be up to it to explain vocabulary on the fly
> M: but, I'm, that, that website ((= *Harrow*)) is so good, you know, and it reads so well that I think, I thought, because it is one of those most prestigious public schools, at least I think so from what I read about it, they have such a beautiful website, and that should tell us that the school is quite up-to-date, shouldn't it? (…) It is really good, <u>really</u> good, and I have tried to make it ((= *the task*)) so that you can follow one of the links and find the answers to the questions, because there are lots of links but the point is, that from the questions I have asked, they should be able to go more or less directly inside
> (…)
> R: Do you get the impression they cut and paste in order to get the correct answer?
> M: Yes…, they, here they cannot do that, here it is not possible to cut and paste, not in this task
> R: No?
> M: Because here they]
> R: [the questions are like that?]
> M: [the questions are formed so that they cannot cut and paste

[164] At the time of writing the URL for Harrow is < http://www.harrowschool.org.uk/>

The above passage shows how an experienced teacher in the process of appropriating ICTs acts with the artifacts involved. Marie's approach is characterized by a utilitarian point of view; ICTs are expected to serve a curricular goal in a certain way, not transform it. Also, there are concerns regarding keeping on top of the situation. The website has been pre-read in order to be prepared for questions so that Marie can provide relevant input. Such designs seem to echo the *agenda-setting dilemma* addressed by Putnam and Borko (1999:9) who sympathize with "the classroom teacher who wants to empower children to build upon their own thinking while simultaneously ensuring that they learn expected subject-matter content".

However, there are signs that Marie's appropriation is not just moving along instrumental dimensions. For instance, the way she has carefully devised questions that cannot be answered merely by copying text points towards a conceptual understanding of the Internet. Moreover, at least one task transcends the basically workbook-like task design: "You are to visit Harrow with some friends – how do you get there?" results in learners exploring the net in a much more open modus than the more text-oriented questions require. Learners check the location and find the appropriate train line, the nearest Tube station etc. This type of task seems to borrow from Helen's designs, which as a rule exploit the exploratory affordances of the net. For instance, when using search engines to corroborate or disprove certain information in connection with a text in the reader, Helen states that "I deliberately made it [= the task] to exploit their searching skills, I never pointed them towards the URLs in the textbook".

Technologies *per se* are not the only factor in the appropriation process. In Marie's case this aspect surfaces during an episode in which small groups of learners use the Internet to gather material and prepare a talk on English literature around the world (they are to choose a country and a more specific approach themselves). Typically, this more open assignment is designed by Marie late in the school year, May 7, when she has become a more seasoned user. While learners work autonomously and on-task, Marie turns to the researcher (my translation):

> Suddenly, you are, you are not the active party any more, you are the facilitator as the term goes, it's a bit new to me and I have not quite got used to it, even though we have been doing it a few years. (…) Not being in the driver's seat doesn't bother me, because I am still at the wheel, but it does bother me that I am not active, that I become passive, like… you are supposed to be energetic and be active (…). It is so good the way we, when have French sessions and we work and five learners call my name at the same time, <u>that</u> I like, because then I feel <u>useful</u>, see? Hehe. (…) They ((= *the learners*)) are used to this ((= *collaborative project work*)), everybody's doing… but I'll be darned if I know what they're doing, you know, hehe. (…) This is the most difficult phase, until they have decided on what they…, basically they are completely free, it is supposed to be about literature but it seems they have shelved that, they may just as well write about politics or history or whatever they want from the country in question. I have told them that they are free to choose.

The passage above illustrates several points. First, it represents a contrast to the much more structured approach used with the Harrow website. Marie now conveys a much more relaxed attitude as to how learners go about the task and how learners shape and even transform the initial assignment. Also, the teacher's power and control are exercised more subtly ("not being in the driver's seat … still at the wheel"). As a result, learners have become empowered through their diverse approaches to the task.

However, Marie has difficulties reconciling herself with what she sees as a passive role, here defined as not being consulted by numerous learners simultaneously. She keeps looking for a

middle ground between the bipolar variants of instructor and 'guide on the side' but finds herself in an educational *horror vacui*, cut off from the lively interactions she finds so stimulating in her French class. It is as if the collective voices of *The Tower* that signal loss of control, learner empowerment, and new teacher roles and designs have become embodied in Marie's reflections. As numerous studies have shown, teachers' beliefs about learning and how they see their own roles are also decisive when ICT-infused practices are formed (Hughes, 1997; Karsenti et al., 2002; Meskill et al., 2002). These concerns address the much needed development of didactics in ICT-rich learning environments where simplified metaphors like instruction and facilitation do not capture what emerges as a need to explore teachable moments, in the present study referred to as *joint scripts* and third space. Metaphors of scripts and spaces can better capture the relational aspects involved; e.g. the participatory opportunities afforded by digital networks. Also, such metaphors capture interfaces between the school subjects and learners' lifeworlds. Consequently, they need to be linked to the development of teacher professionalism.

With a repertoire of *designs* as the essential component at both Mercator and Minerva, other similarities between the two information ecologies follow. For instance, so much more of teachers' practices appear in the form of technologies prepared to cater to certain activities, shifting the workload towards a more pro-active and indirect orchestration of activities. Both Helen and Marie lay down painstaking preparations. In this way, initiatives that used to be part of the traditional, more IRF-driven session, have become exocentric to it in the form of emails and websites that link learners to the learning activities before, during and after a class.

Still, technologies prove to be fragile at Minerva as well as Mercator. This is especially true in the case of a data/video projector that persistently shuts down after about 10 minutes. During learner presentations (with e.g. PowerPoint) this is especially disruptive. At one time, an episode of close to 12 minutes is spent getting the projector back to life. This happens in the middle of a learner's presentation. Several pupils willingly assist Helen, who is fairly unperturbed and turns to the researcher,

> This has happened before, you know, when we had this 'Open School Day' the same thing happened, the projector worked well for a while and then it stopped just like this. And I don't think it's the bulb. ((*more attempts, learners assist, no result*)). OK. OK, I'm going to get an expert, OK? ((*To Karin, the presenter*:)) You'll just have to sit here and talk to the class a bit
> Karin: ((*to class*)) Well, I'm certainly not going to entertain you!
> L: this should be good for your self-confidence ((*good-natured small talk follows*))

Similar episodes make Helen almost abort the presentations project "Let's do the competition instead, that's the way it is. Let's just, let's leave it on, then we'll try after the break". However, a technician always seems to be near enough to save the activity, and sometimes a tech savvy learner who is appointed teacher assistant is able to find the solution. Like at Mercator, some learners take a special interest in getting the technology to work by offering usually informed guesses.

The noticeable difference between Tom and Helen in these similar situations (see Chapter 5.5.2) is that Tom leads a solitary practice in the tradition of the secluded but competent and innovative group from the 80s. His considerable technical know-how usually is enough to fix any ICT-related trouble. Helen is much more part of a community where technical as well as pedagogical issues are sought resolved together. The following excerpt from another episode involving projector breakdown illustrates a situation where Marie is present:

Helen: Gitte?
Gitte: yeah?
Helen: before you start opening your HotMail box, could you please show me how to, you know operate the canon? You remember?]
Gitte: [er, yeah
Helen: I found no 'properties' but, ahm, I couldn't find this other thing that I should do, like eh, you know I always have trouble with this if they have… you see, I'm going to eh, take, eh, 'properties' here]
Gitte: [yeah
Helen: yeah, and then I get]
Gitte: [yeah *(unintelligible)*
Helen: no, and then I should have 'innstillinger' *[= settings]* but…
Gitte: 'start'
Helen: yes, 'start'. OK. And 'innstillinger'] *[= settings]*
Gitte: ['innstillinger' and then *(unintelligible)*
Helen: yes, that's it, then I think I'll manage

This goes on for a minute or two, Gitte guiding Helen through a sequence of which buttons to press until everything is working properly.

Helen: thank you Gitte! He-he. ((*To Marie*)) No, there is always some fuss about this when, you know, they have used it! ((*referring to colleagues who have changed the settings*))
Marie: I am only so happy I managed the other day

Another similarity between Mercator and Minerva is the interface position of the teachers involved. Whether it is working at the interface of literacies and technologies, physically located and virtually distributed environments, or two activity systems in tension (see Chapter 5.5), these positions are typical of the three teachers observed. Even Helen, who initially denies having fears about not covering the curriculum admits that "on the other hand, I found it [= working on a transatlantic project] scary, because, you know, it means losing some control, because I like, in a way, to have some control, that they manage to get through their curriculum and…". In sum, these observations point to the importance of backing up and sustaining change in practices with institutional innovation and support on organizational and curricular levels. Concentrating solely on classroom practices is insufficient.

Also, the layer of learner interactions (cf Figure 6.1) found at Mercator is just as noticeable at Minerva but, again, not always recognized by the teachers (and, hence, may explain some of Marie's feeling of passivity). Learners at Minerva voiced the same priorities as their peers at Mercator: the teacher is rarely consulted until other alternatives have been tried in the form of classmates or software.

Finally, the extensive use of online discussion found at Mercator and the use of *NiceNet* has its counterpart in an ambitious online project at Minerva using email, websites and *Yahoo Groups*[165]. The use of *Yahoo Groups* has been going on for some time, and the previous year Helen and another colleague (Siri, presently on leave) with their Norwegian classes engaged in extensive exchanges with American college students and their teacher. A typical illustration is found in one of the many messages exchanged between the teachers involved:

[165] *Yahoo Groups* <http://groups.yahoo.com/> differs from *NiceNet* in the sense that it is more an asynchronous discussion forum than a virtual classroom. Yahoo Groups offers several ways of staying in touch, e.g. by means of sharing files (texts, images) and planning events, but it does not offer the more synchronous mode of *NiceNet* utilized by Tom and his learners.

From: Helen
Date: Tue Mar 6, 2001 1:59 pm
Subject: Further progress

Hi Hannah!

Siri and I are trying to get familiar with Yahoo Club right now. Siri's students have tried to send their presentations along. My class will make an attempt tomorrow.

Here are some challenges

Where do you want us to paste the assignments? Which groups are going to correspond with each other? And how?

Re. News - Is it possible to provide news from the USA as well - eg. CNN? Just wondered....

Regards from Siri and Helen (we are pleased with the pics)

The brief message above points to a series of complex tasks, both for learners and teachers. And complexity increases when learners are placed in the role of peer teachers, as we will see shortly. This proves to be a very ambitious design and one that deviates from the way online environments were used at Mercator. Consequently, the Minerva exchange project will be treated next in order to explore additional aspects of the practices teachers engage in when using networked technologies.

6.9.4. Beyond the classroom: ambition or hubris?

Minerva in Norway and St. Sunniva College in Minnesota, USA collaborate on a language project which involves Norwegian pupils learning English and St. Sunniva students learning Norwegian. St. Sunniva College is an institution closely linked to Norwegian heritage in the US. The project is to a large extent based on reciprocal peer learning where Norwegian learners mentor American learners and vice versa. Often, this means that the texts written by learners (American as well as Norwegian) are partly in English, partly in Norwegian. In Norway, the use of first language in an EFL context at senior high school level would normally be seen as contrary to the goals associated with communicative competence and (therefore) systematic use of the foreign language. A 'hybrid', bilingual practice with a first and a foreign language simultaneously at work is a phenomenon that might become more frequent as digital networks increasingly facilitate cross-cultural communication.

This year (2001/2002) three classes at Minerva, all at different levels, take part in the exchange project: foundation course, second and third level, which together cover the Upper Secondary School system in Norway. The exchanges are partly organized by way of a website for each level, partly by way of a separate *Yahoo Club* for each level, and chat sessions are arranged to communicate in real time. In addition, email is used, although to a lesser extent. Activities include:

- Exchange of news
- Topic of the week (in the US and Norway)
- Comments on emails exchanged
- Comments on language proficiency
- A calendar (as part of the website) used to keep information persistent and updated

During one of the sessions, while learners are checking messages from their American peers, Helen explains how the idea came about (my translation):

> H: I have two uncles, I have had very little contact with them, they live in Østfold close to the Swedish border, and they are not married, there are no children or family or anything, so there is just me and a niece left
> R: I see
> H: And, eh, so they just wanted, they asked me if I could take care of them ((= *the letters*)), and that's it
> R: And that gave you the idea for this project?
> H: Yes, because then I thought "Oh dear", and I got so interested, and there are so many stories about them and, and they are from five siblings, my grandfather's brothers and sisters who wrote the letters and then I thought that it's not just me, you know, who have relatives without being aware of it, and everything, and this may be the situation for the learners as well, and then, but then there was everything about ICTs and stuff, in a way I was so interested but in another it was a bit frightening because it involves losing control, because I like to have control so that they get through the curriculum and…

Control, one of the recurring concerns from *The Tower* survey is here associated with delivering the curriculum. The educational potential in the real life point of departure (the letters, possible relatives of learners etc) is seen by Helen as immediately constrained by organizational and policy factors, placing the teacher in a squeeze as to how to operationalize the potential. When Helen goes on to explain how the learners and herself went about realizing the potential, it also becomes clear how this process involves multiliteracy skills (as discussed in Chapter 3.8):

> R: But the collaboration with St. Sunniva, if I understand this correctly, came about when you searched for partner schools?
> H: Yes, mhm
> R: And how did you do that?
> H: Well, we made a brochure about the school, so…, there were already a few pictures of the school on the website, so we already had a brochure, so it was purely a translation task]
> R: [into English?]
> H: [and we took some of the pictures, and uploaded them…
> R: On the net?
> H: On the net, yes, and then we sent a few letters, and then we focused on the Midwest, because we talked about where…
> R: Yes
> H: Where Norwegians settled and things like that, and then we watched *The Journey to America*, you know, a historical movie from Norway, like, and we read several America letters, and they searched with this "search the web" – what's it called- now I've, because they can look up their name, their last name, you know…(…) and they could search the whole of the USA, for their last name, and see if, like, if there was anybody named such and such and where they lived and in which state and so on
> R: Yes
> H: And then quite a few discovered that they had relatives there, you know, OK, then we should find something (…) we used several links, then we wrote them and, and asked if they could help us, and then these regional societies ((= *bygdelag*[166]))
> R: Yes
> H: Telelaget[167]

[166] Regional societies, *bygdelag* in Norwegian, have a website at <http://www.hfaa.org/bygdelag/>
[167] *Telelaget*, one of the regional societies, has a website at <http://www.telelaget.com/index.html>

R: Yes, yes

Such efforts resulted in contact with St. Sunniva College and Hannah, a teacher who took an immediate interest in the idea. Hannah turned out to be quite proficient with regard to ICTs and she had historical and cultural reasons for her engagement as well:

> H: (…) and then she, Hannah, she, her great-grandfather was from Sannidal ((*a community in the same county as Minerva*))
> R: Right
> H: So she was very much interested in this because she had good contacts with the College in Telemark, where they supposedly work with a particular exchange program (…) and so that obviously helped, because that means she has classes in Norwegian, right?
> R: Yes, interesting idea
> H: But she has the same problem as me, in a way, in getting a colleague to participate because they are apprehensive about ICTs (…) because she doesn't, she would really like to have another teacher along]
> R: [I see…
> H: [because if not, everything's so fragile, so when Hannah is not there, you know, the results are disastrous, "Oh, help!", you know, we don't get any…
> R: So she is very much on her own
> H: Yes, and it's evident… you have limited capacity, you know, so I have been very lucky when Siri ((= *colleague, currently on leave*)) immediately goes "Oh, I would love to take part in that", and…
> R: Yes
> H: Marie has participated but in a more modest role, and, but so dedicated, you know, so I have had someone to work with, but she ((= *Hannah*)) has not
> R: I see
> H: Because, I asked, what is the reason, like, when she…, no she is very open as to the possibilities with ICTs and stuff while her colleagues…

It appears that Helen is the more ICT savvy of the teachers involved. For instance, she originally wanted to use IRC (Internet Relay Chat[168]), but the others felt it was too complicated. However Hannah, her American colleague, has steadily become more intrigued by the possibilities of computer-mediated communication (CMC) and has attended a course on how to use virtual classrooms.

The lengthy excerpts above show how a large design comes about as a result of the personal stakes of the teacher, how she manages to create a teachable design from an event in her own lifeworld and how she recognizes that this may be relevant to her learners. It is a design that builds upon the notion of a third space, where learners and teachers meet on a new ground and where their personal investments shape their scripts and learning trajectories. In this, the design shares many of the characteristics found at Mercator in Tom's class. However, where Tom settled for in-class interaction and particular topics as the trigger for such interactions, Helen aims at the more ambitious goal of using ICTs to mediate cross-cultural, reciprocal teaching and learning. With a more 'authentic' context there is less 'willing suspension of disbelief' involved, as in some of Tom's role plays and more dramatized or staged designs (cf Chapter 6.4.2 on relationships).

[168] IRC is a text-based form of communication (although colors and ascii graphics may be used) which is very fast and relies heavily on the use of acronyms, abbreviations, 'smileys', and other forms of Netlish (Crystal, 2001, cf Chapter 3.3.2).

Moreover, the VKII class is preparing an excursion to St. Sunniva in the US in January 2002. The risks involved are many, and the workload considerable. For instance, the day before the very first recorded session Helen had chatted online with Hannah for 90 minutes – "It was a long time since the last one" – and preparations for the trip takes a lot of time and energy. The class has been divided into "committees" where some learners work with funding, some work with the media to promote the trip, some work on producing US information and addresses relevant to the trip etc. There are more teachers involved, but as Helen says,

> Obviously this has been a lot of work and…. we had a teacher last year who had to learn from scratch and we have a teacher this year who had to learn from scratch (…) so the awkward part is that we in a way cannot make full use of what the first one learned, but she had planned to take leave for a year…

When trying to bridge in-school assignments with real life activities, there is always an element of hubris involved; teachers and learners become exposed to the unplanned, the sudden change, the twists of fate that do not observe the school format of the 45-minute session on a particular day. In the case of the exchange project and its planned excursion in January 2002, it was disrupted by the September 11 terrorist attack on New York's World Trade Building. Through parental concern, uncertainty as to the immediate safety of air travel etc., the plans were eventually shelved. Also, the momentum of the written exchanges seemed to suffer as if the attack had a numbing effect on participants[169]. On 30 November, Helen comments that engagement from the American side seems somewhat low compared to the previous year and, "I sometimes gloomily think that the American learners are eager from the start but do not have the stamina required". However, she also points to different age groups on the American and Norwegian side as a reason.

Other constraints are found in curricular concerns: "Right now we work a lot on Britain, we agreed that if we travel to the USA we will get a lot of US material later". Also, school semesters are organized in different ways with holidays that do not correspond and the seven hours time difference makes it necessary to revise normal school and working hours. The chat sessions take place in the afternoons and evenings (Norwegian time) with three different classes chatting consecutively, one hour each. With synchronous transatlantic chat, pizza delivery and soft drinks, the notion of "school" is suspended and there is very much a community feeling, according to both Helen and Marie.

To Helen, this experience pinpoints the contradictory nature of her work and the conditions for it (my translation):

> I have some problems with…, I work so much with these things, and then, eh, and then it's, eh, and I want to work with this, but, eh, you are not freed from other tasks, and I don't want to use money for the project as overtime pay, like, where should we take it? (…) So it's evenings like these, you know, and it's unbelievably communal, it <u>is</u> so much fun, right? It is <u>so much fun</u> you know, but, eh… that's very good and, I think that people could stay on at school beyond a particular time, but of course you will have to let off from other things, I cannot attend all meetings, I cannot be everywhere as I hold only 80% of a full job you know, so, or I get 80% salary while I probably work 150%...

[169] The present researcher's first visit to Minerva had been scheduled for September 12, the day after the 9/11 attack. No taped material was made in the classroom that day but field notes describe how everybody is marked by the event. As the observations at Minerva were made at less intensive intervals and more at random over the year, further short-term effects are not available from notes or tapes. Hence, the 9/11 attack and its possible influence on all involved will not be made subject to further speculation.

On these issues she is backed by Marie who often steps in for Helen at meetings and who, Helen emphasizes, gives her so much moral support. This situation is clearly different from the one at Mercator where Tom led a more solitary practice. Judging by the many enquiries he receives in breaks and the amount of time Tom puts down in his designs, it is easy to see that such a solitary practice can function as a means to avoid being caught up in time-consuming collaborative work with colleagues. Without knowing these circumstances, Helen recognizes that this is indeed a pressing issue and one that requires innovation. After stressing that her role as a designer is "a lot of fun" and that she would get bored if she had to do the same thing twice, she says (my translation),

> H: I think it's exciting to design things, think methodology all the way (…), and there should be a lot more of us sharing ideas, that is, you should make room for that within…, if you are to work within a fixed time and all that, then some time should be allotted for precisely those things ((= *sharing ideas*)), because it's, you get so much in return from the learners, they… you know, some variation in the way we teach, I think schools have to change drastically, you know (…)
> R: We are not talking slight reforms here
> H: No we are not, we do not speak the same language as the younger ones any more, all things considered, you know, we might be heading for a clash, and this happens so quickly, that they are moving away from us

Helen's views address the fact that the emergent and ICT-rich practices do not correspond with the organizational and curricular context in which they become manifest. Helen also voiced a similar concern when she felt that the whole project might endanger the task of getting learners through the curriculum. The above statement points to how learners are changing as well as the need for drastic changes in education, perhaps a somewhat painful realization of the complexity involved in the exchange project. For instance, a shared screen (Dillenbourg & Traum, 1999) or even a shared online environment in the form of *Yahoo Groups* is not necessarily self-sustained. It might take a lot more active initiation and moderation on the part of the teacher than a 'guide on the side' metaphor would imply.

Finally, one element that might challenge a teacher is the 'parallel' use of two languages. Could the use of English and Norwegian at the same time disrupt the efforts to learn the foreign language or could such use of first and foreign language serve as a powerful mediational means to write about the same topic in two linguistic codes? It is beyond the scope of the present study to answer this rather far-reaching question[170]. On the other hand, the example may point towards language practices that may become more common as the distance between various linguistic manifestations is greatly reduced in digital networks and bring about hybridity. Zones of 'linguistic purity' might give way for hybrid practices, a phenomenon touched upon by Crystal (Crystal, 2001a, 2001b) and The New London Group (Cope & Kalantzis, 2000). This, too, would challenge teachers' traditional notion of literacy.

Although the project became somewhat reduced since the excursion was cancelled, the preparations that went into it illustrate the amount of work, the complexity of this work (e.g.

[170] Kris Gutiérrez et al. (1999) consider such hybrid practices as belonging to the learners' zone of proximal development, a view that would challenge the view that foreign language teaching should be conducted as far as possible in the target language. According to Gutiérrez et al., multivoiced, polycontextual, and hybrid language practices do not subtract but add to the richness of the ZPD, and is related to the heterogeneity found in the multiscripts of *third space* (cf Chapter 6.4.7). This view also places the use of hybrid language practices within a teacher's design and not as something to be avoided.

time zones), and the mismatch between the organizational structure of traditional schooling and the nature of such a project. The result was that Helen and Marie together with their learners had to co-construct new forms of activities as they went along. Other researchers have reached similar conclusions. In his study of electronic literacies in four classrooms, Mark Warschauer (1999:100) observes two disappointing cases involving email exchanges and concludes: "It appears that successful e-mail projects involve a tremendous amount of coordination, with teachers from two or more different schools co-managing both curricular goals and practical matters". In another study of teachers and technoliteracy, Lankshear et al. (Lankshear et al., 2000:22) find that, "teachers still have limited experience of 'real-life' developments and applications of new technologies occurring beyond the school gates".

In one of the talks with Marie she, like Helen, emphasizes the need for teacher guidance, didactics, and methodology. She goes on to complain about how staff meetings are felt to be irrelevant for most of the teachers because "there is hardly ever anything about methodology". Both teachers attach a lot of importance to the need for didactic development, an echo of findings from *The Tower* survey. Traditionally, the role of the teacher has been the one who knows what is to be learned (curriculum) and who has a repertoire of historically legitimized practices to employ. With networked ICTs, what counts as knowledge and how to build and share it are open to renegotiation and hence practices that are learned as they are put into effect. It would follow that teachers are in need of a more sophisticated and far-reaching concept of what technology-rich and networked learning designs involve. Orchestration of affordances and constraints extends far beyond the task at hand and into practices that draw on 'real life' versions of the school subject. Judging by the tensions seen developing between practices and organizational context, 'school-like' and 'life-like' tasks, this should be a pressing concern for all teacher education. In short, it seems as if an understanding of what it means working at the interface (see Chapter 6.5.3) must be operationalized on a didactic level.

6.9.5. Presentations: old wine in new bottles?

One important aspect of ICTs is the way they have come to facilitate, support and 'aestheticize' presentations. Technologies in the form of hardware (data projector, interactive digital whiteboards) and software (desktop publishing, multimedia web tools) are conducive to learners taking the floor. On the other hand, such presentations might be criticized for sustaining practices associated with delivery of information in a linear and stereotyped format. One particularly infamous change of final format is the use of slide shows and in particular *PowerPoint* presentations (maliciously said to leave the audience powerless and the presenter pointless).

However, observing learners in Helen's class doing *PowerPoint* presentations at Minerva, the picture seems less one-sided. True, the presentations themselves were essentially closer to the curriculum oriented 'in-school' routines that Lankshear et al. (op.cit.) criticize. But the process of learners working towards their presentations took on dimensions that might be seen as promoting a 'real-life' authenticity. One of the challenges of modern working life is to inform colleagues on different levels on the basis of information gathered, sifted and evaluated, and using technologies to mediate the message. In light of this, the learners in Helen's class are engaged in highly relevant practices. What is more, as English is truly a global and online language (cf Chapter 3.3), chances are that young learners will find themselves in situations where their appropriation of multiliteracies (linguistic, cultural, digital, critical) are put to the test. In other words, while presentations might represent a danger of using technologies for the sake of technologies, there is a potential for coherent and

mature social practices in them. Again, the design framing the activity is important, but this time the learner more than the teacher develops the design.

The class doing the PowerPoint presentations is Helen's VK1 class. The curriculum for this level requires that learners do one written and one oral project work. They choose according to a list of nine suggested topics in the curriculum (Economics, Technology, Travel, Art etc). The oral presentations are mediated and supported by various technologies, and in addition to PowerPoint learners at Minerva use tape recorders, CD-players, and on one occasion showed a home made video that parodied Jamie Oliver, 'the naked chef'. However, most presentations are fairly similar, relying on PowerPoint slides and learners' use of key words on post-it notes or manuscripts. Most learners work in pairs, agreeing on a division of labor in preparations as well as in presentation but a few make individual presentations. Presentations are followed by questions or comments, partly from classmates but more often from Helen.

Asked about the competence that goes into such a presentation, learners refer to a booklet that introduces them to PowerPoint and, more important, their experience from the foundation course in which the subject of *Economics and IT* included use of PowerPoint. Quite a few of the learners in this class have also used PowerPoint in previous presentations. The following view is representative (my translation):

> R: So it is not a new situation when you face the class using PowerPoint, you have done it before?
> L1: Yes, we did before Christmas too
> R: What do you think about it?
> L2: I think it is nice
> L1: It is cooler than just standing there talking. Now people have something to watch as well, while we talk, then we do not get all the attention and you've, like, got a few keywords to help you, so that's really very comforting
> (…)
> R: So you are spared the feeling of recitation?]
> L2: [yes
> L1: And because you, like, even if you look at the screen you don't stand like <u>this</u> ((*demonstrates how head is buried in manuscript*)) and just read, you know

It appears that the use of technologies in the presentations transforms an often sterile, routinized mode of delivery into a more lively and meaningful activity. Looking at the presentations as a whole, they sometimes come close to a *design* (cf Chapter 6.4). with their deployment of artifacts and orchestration of an activity. They also require research into a subject matter in which the research is carried out by learners and might be supported by the teacher. Research is as a rule carried out online, but quite a few use the library in order to find relevant material. This is another instance of the learner – teacher dichotomy being suspended in favor of possible joint scripts. Also, it is an example of learners being empowered within the institutional constraints. One could say that the genotype qualities in the technology have contributed to a more learner-oriented and empowered practice. *The Tower* survey also found that learner empowerment was one of the more salient features when ICTs become a staple element of the classroom.

For instance, learners were able to put together 'professional-looking' slides that served as a combination of outline for the talk, keywords to remind the presenter(s), and with effective graphics. The single PowerPoint slide found in Appendix 5 will have to suffice as a typical example. It is taken from a series of slides that backed up two learners' presentation of their

oral project: *What to do in New Zealand*. The singular slide shows how the learners have used one of the available PowerPoint templates, added a diamond-shaped bulleted list with key words, used a clip-art graphic that suits the exploratory mode of the presentation (the jeep moving towards the list of key words), and arranged the whole thing in an orderly manner with enough white space to avoid a too busy impression. Over this and similar constructed slides, the two learners took turns describing and commenting upon possible destinations. The slide series and the shared talk serve as an example of multiliteracy, an aesthetic-linguistic code that captures slices of the outside world.

Empowerment is also carried over to classwork assessment in the form of portfolios. Helen explains that learners place an assortment of written works in their portfolios, i.e. electronic folders on the school's server. This folder may contain everything from applications, creative writing, summaries, and mails to and from their American peers. The learners receive a list of minimum required items, but are free to add whatever they like. Helen accesses these folders twice a year, and uses them when deciding on marks. Performance oriented assessment is thus complemented by the more contribution-oriented character of the portfolio. Thus, where Tom and Mercator enjoyed the affordances of the new style exams, Minerva has developed an assessment system that to some extent compensates for this affordance. It also serves as an illustration of how assessment needs to be seen as a highly situated, socially constructed practice.

But then again, empowerment does not come automatically as a result of ICTs being deployed. The authentic, mature practices that could be seen at Minerva were also contrasted by presentations that were little more than delivery of slightly recycled Internet material with little or no reflection. In their book on teachers and technoliteracy, Lankshear et al. find a particular form of conservatism in the way new technologies merely repackaged familiar routines. This syndrome, referred to as old wine in new bottles, is described as follows:

> *Long-established classroom language and literacy education routines were now being undertaken as slide-show and webpage presentations (…) The final format is all that had changed. Many practices, indeed probably the majority of those observed, were quintessentially 'school-like' in structure and content, the main difference being that they had been 'technologised' (Lankshear et al., 2000:117).*

While it is easy to see the above point, the present researcher feels that it does not pay justice to the *potential agency* afforded by a suite of presentation technologies. Also, as argued earlier, such practices should not be regarded as only 'school-like' as they are integrated in nearly all aspects of working life. The quality of such presentations is another matter. As in other types of activities described and analyzed in the present chapter, teacher scaffolding and intervention are called for. In the case of the PowerPoint experience at Minerva such intervention might contribute to achieving the full potential, in the form of developing a multiliteracy, afforded by the combination of technologies and the particular discourse of presentations. Still, the bottom line is that the presentations at Minerva do not lend support to e.g. Larry Cuban's (1986) often cited observation that school practices are not changed by emerging technologies but that schools rather adapt them to fit into traditional practices.

6.9.6. Helen and Marie – a community of practice?

In Chapter 5.8 the constructs of *communities of practice* and *legitimate peripheral participation (LPP)* (Lave & Wenger, 1991) were briefly presented. In Chapter 5.8 they were discussed in the relation to *The Tower* and found to be somewhat insufficient in capturing the characteristics of this online group. Also, when we look at the situation of Helen and Marie

and the relations they enter into, the community and LPP metaphors may not capture certain important aspects of these teachers' situatedness. The following is an attempt to uncover some of these aspects and how the two teachers might be seen as participants across several communities.

Helen and Marie represent two different paths in appropriating technology; the former from the position of an informed user but still developing a repertoire of new practices; the second from the position of a novice. In other words, they are both in a process of appropriating technologies but from different positions. This is something they have in common with hundreds of colleagues and what may loosely be referred to as a community of teachers. In essence, the two form an asymmetrical dyad with Helen as the more knowledgeable as ICTs go and Marie actively seeking to appropriate Helen's insights so as to develop her own practice. In many ways this is reminiscent of a mentor-apprentice model.

Invoking the community and LPP metaphors, however, should be done cautiously and for two reasons. Firstly, the community in question may not be one but several; the two teachers form a dyadic relationship, the people involved in the ICT-intense practices at Minerva (learners, colleagues, administration, technicians) amount to a more communal but less proximate group, and *The Tower* participants also represent a distributed, loosely knit group of colleagues. Secondly, and following from the first, is that the 'move toward full participation' may not be seen as one from the periphery towards the center of one community. The community in question is multiple and does not lend itself easily to the LPP metaphor. Instead, we might regard teachers appropriating ICTs as constituting a community of discourse and within this discourse teachers appropriate technologies not just by participating in a community of practice but by participating across *several* communities. These may be at different levels; collegiate dyad, institutional, and distributed online. There will be overlapping in the shared goal of appropriating technologies but the relations between participants, activities and artifacts will be different at each level:

On one level, the dyad of Helen and Marie comes across as a master-apprentice relationship where "the roles of masters are surprisingly variable across time and place" (Lave & Wenger, 1991:91) and where mastery does not reside in a person but develops in relations with other members of a community. As for the apprentice, her role also changes throughout the time of observation, and cannot be said to be fixed or situated once and for all. For instance, Marie regularly accompanies Helen in the latter's classes to get the feel of how ICTs are integrated, and Helen sometimes pops in at the beginning and near the end of Marie's classes to check that everything is all right. She also seeks out Marie for advice and opinion on her own ideas and designs. During the time of observation, there was a lot of information exchange in the numerous but brief informal discussions between the two. Accounts, anecdotes, and ideas were exchanged. For instance, Helen often includes Marie on her mailing list for her class in order to keep her posted on activities. The following is a brief excerpt from a session in which learners are in the process of reading instructions for a quiz. Marie has joined the class to observe and learn.

> Helen: you can just open your HotMail box in order to read your mail. ((*Pause, Helen and Marie checking how learners are doing. To Marie:*)) I've sent you a mail as well so you could also do the quiz, he-he
> Marie: Oh…
> Helen: yes, if there is a machine available, you could, eh… ((*short pause, checking on a learner*)) he-he, yeah, that's a tricky one

In this way, among other learners in Helen's class, Marie is gradually apprenticed into ICT-infused practices by taking a place in the midst of other learners. The brief excerpt above shows how in Marie's case the teacher/learner distinction is suspended, she is participating on par with the other learners in Helen's class: "It seems typical of apprenticeship that apprentices learn mostly in relation with other apprentices. (…) engagement in practice, rather than being its object, may well be a *condition* for the effectiveness of learning" (Lave & Wenger, 1991:93, emphasis in original). Marie's legitimate peripheral participation can be seen as a *learning curriculum*, "a field of learning resources in everyday practice *viewed from the perspective of the learners*" (op.cit.:97, emphasis in original). This type of practice transcends the dyadic form and forms a link to the institutional level.

On another, institutional level the two teachers are assisted by technicians (one has been allotted time to help Marie) and one learner with considerable ICT competence (who is compensated for assisting Helen): "Fortunately Richard, eh, is present. What should we do without him?" More peripheral, but important, is also support from school administration and the fact that Helen and Marie's efforts to bring about a Norwegian-American online project is met with enthusiasm by colleagues. Finally, the teacher and the students at the American college with which Helen and Marie try to establish a joint project also fall within this extended community, although as a less persistent factor. What emerges is hardly a community of practice in the strict sense of the construct but a somewhat loose constellation with a common purpose. By trying to fulfill this purpose, teachers and learners take part in a learning experience but without any mentor – apprentice relationship. Once again, we see how the teach – learn dichotomy is eroded by practices that involve use of networked ICTs.

The third type of community is illustrated by *The Tower*. Partly distributed and online, partly assuming a particular location (for individual or collaborative work) it stretches the notion of community. Lave and Wenger do not see a community of practice as a well-defined group: "It does imply participation in an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their communities" (op.cit.:98). In this sense, the group of teachers at Minerva who participated in *The Tower* together with the other participants in the course can be said to form a community, although (as discussed in 5.8) the term discourse community may be more apt.

The three dimensions of community – dyadic, institutional, distributed as illustrated (above) in the case of Helen and Marie – indicate that a) there does not exist any community of practice that accommodates teachers' appropriation of ICTs; only dimensions of a discourse, and b) that so far any community of the sort would first have to develop the practices that constitute it. The implication is that any form of legitimate peripheral participation in a community would have to be seen as participating in cultural renewal more than being socialized into a practice that already exists. It follows that if a community of practice is seen as conducive to developing teacher professionalism in ICTs, this community must be constructed through the practices of the teachers involved and from how these practices weave together individuals, collectives, artifacts and cultural context. Also, such a community would be partly co-located, partly distributed and without a clear mentor - apprentice model. What is needed seems to be teachers who develop a kind of relational and situated *expertise* (elaborated below), who are sensitive to the complexities involved when they seek to reconfigure classrooms around the interaction between learners, teachers, and digital artifacts.

6.10. Conclusion: Situated Expertise

> *(…) the work of a teacher can never be stereotyped or routine; the teacher's work always carries a profoundly creative character*
>
> *Davydov, cited in Daniels (2001:29)*

Through observing ICT-rich classrooms at two schools we have come to learn how three teachers go about designing and orchestrating environments and occasions for learning. As they do this they also come to appropriate the technologies involved beyond conceptual and instrumental dimensions, thereby increasing their professionalism. Broadly, what teachers know and can do amount to teacher professionalism; an umbrella term that comprises several forms of expertise. Obviously, expertise is needed when making ICTs in education conducive to learning. However, expertise is not easily defined, nor is it a timeless, universal, and abstract construct. In the short history of ICTs in education, expertise has often been understood as having superior technological skills. *The Tower* survey as well as the classrooms observed tell a different story. Here, technologies are fundamentally *social*, i.e. they bring individuals into contact with other individuals and with resources produced by others. Thus, teachers' ICT-related expertise needs to be addressed in social and relational terms. In abductional terms (cf Chapter 4.5.6), the phenomenon under observation has been pursued from a sociocultural perspective since this perspective is capable of explaining the phenomenon. Three aspects of teachers' ICT-related expertise will be emphasized in the following; the ability to manage complex relations, distribution, and transformation.

Complexity has been a *Leitmotif* throughout the present study. It has been the intention of the present chapter to demonstrate how life in ICT-infused learning environments is indeed complex, multivoiced and polycontextual. If teaching is a complex endeavor, it becomes even more so when artifacts become digitized and – along with their users – increasingly networked and distributed. Technologies open up new opportunities but require sophisticated designs and a high level of teacher professionalism if learners are to take advantage of the inherent opportunities. The meticulous care the three teachers placed in arranging for diverse learning opportunities, their designs, testify to such professionalism. The same can be said of the broad didactic repertoire demonstrated by these teachers when such designs are operationalized in the classroom. It follows that for teachers it is insufficient to adopt the role of a facilitator or 'guide on the side'. Instead what is needed is expertise, not as a clearly defined state of knowledge, a level of competence, or as a set of discrete, decontextualized skills. Neither is expertise seen as unquestioned authority in a particular field or school subject, nor is it a property found in a particular teacher. Rather, expertise is developed by people partaking in progressively more sophisticated and demanding activities that, at least in the case of ICTs and EFL, involve multiliteracies. In addition, practices at Mercator and Minerva show that such activities are synchronically 'layered' as well as diachronically challenging the traditional, 'given' slots for a subject to be taught. Anne Edwards (2002:125) also addresses such complexity in her view of "expertise as a capacity to interpret and respond to the complexities of practice in increasingly informed ways". This means that *expertise is equal to the process of maneuvering in complex relationships where humans and artifacts form social practices that are never fixed or can be pinned down in a 'didactic method'*. This is the first characteristic of expertise.

Tom's use of *NiceNet* and Helen and Marie's use of *Yahoo Groups* demonstrate how people are realigned around tasks and practices that make use of digital and networked technologies. The same is true of the teachers who participated in *The Tower*. New epistemologies emerge as knowledge is seen as socially constructed, distributed, negotiated, shared and not just

transferred. To quote Yamagata-Lynch (in press:4), "teacher knowledge is a shared entity that is distributed among individuals, activity, and artifacts". Expertise can be seen as a particular dimension of knowledge and shares the characteristic of distribution. Guttieréz and Stone put it this way,

> *(…) we challenge the commonly held notion of expertise as being located in one individual and illustrate instead how expertise exists both in the individual and in the group and their subsequent interactions. In other words, we try to account for the ways in which thinking is distributed in social settings (…). Expertise in this context is redefined as a socially and situated construct (Gutiérrez & Stone, 2000:160).*

The views of Yamagata-Lynch and Gutiérrez and Stone echo the theoretical perspective of *sociogenesis of the mind* (cf Chapter 2.2) and flexible and distributed epistemologies (Lea & Nicoll, 2002b). In this perspective, a teacher's professionalism as well as identity will be challenged by the transformational power found in interactions between individuals, collectives and artifacts. Learners as well as teachers create identities by taking part in different communities as well as working across them. In the case of the present study, we have seen how the EFL community, the ICT community, and the didactic community (cf Chapter 3) converge in a nexus of diverse social practices. This nexus represents a break with the image of the teacher as an individual subject authority. It follows that *expertise is equal to acknowledging and determining the distributed nature of knowledge, across humans as well as artifacts and domains*. This is the second characteristic of expertise.

The two characteristics above involve the ability to be prepared for the unexpected and even the unwanted in order to transform such features into 'teachable moments', the ability for teachers to include serendipity and disruption in their repertoires. According to Hoel (1998:118, my translation), planning and implementing teaching has been "a typical characteristic in traditional descriptions of subject didactics". In the case of the teachers observed, we see how this characteristic is more visible in the case of Marie's early designs with their dependence on textbook and prepared websites, while in the case of Helen and (especially) Tom there is more risk-taking involved. They have learned 'to let go', to quote one of *The Tower* participants. In the episodes analyzed in the present chapter we see how positions shift, how teachers, learners and technologies interact in ways that offer an array of rich and complex opportunities while the socio-historical dichotomy of teacher and learner is potentially eroded. We have seen how the IRF model, traditionally a teacher-initiated discursive feature, in ICT-rich environments becomes challenged by more complex and less predictable IDRF patterns (cf Chapter 4.7.2). As activity triggers no longer are the teacher's sole responsibility but found in the actions of learners and in the interactive potential of ICTs, the IDRF patterns emerge as one of the more salient representations of a classroom in transformation. Gee et al. (1996:57), building on Bereiter and Scardamalia, define expertise as "the ability to work in non-routine ways on ever more demanding problems in whatever domain they are confronted with". This particular form of expertise with its emphasis on innovative practices is complementary to its relational, social and distributed nature discussed above. However, the above definition also emphasizes the dynamics involved and the lack of domain specificity. With the impact of ICTs the nature of the school subject changes and the boundaries between subjects give way for cross-curricular practices. One could well say that these aspects capture the transformation of the classroom that the practices at Mercator and Minerva point towards. This means that *expertise is equal to efforts of transforming classroom practices in accordance with the relational and distributed aspects of knowledge construction*. This is the third characteristic of expertise.

A view of ICT-related teacher expertise as it is outlined in the three characteristics above may seem to place the technology too far in the background. However, the intention is to make them transparent, seamlessly interwoven into the practices they enter into. Consequently, teachers' articulated needs for more instrumental mastery (cf *The Tower* sample) is heeded, but made secondary to the social practices they enter into since these are challenging and changing traditional classroom activities. After doing several classroom studies of literacy learning and development, Kris D. Gutiérrez and Lynda D. Stone (2000:150) observe that "we have begun to recognize how much we have underestimated the complexity of classroom life and its relationship to literacy development". The present study argues that such complexity increases considerably when technologies are assimilated into our notion of literacy.

As studies of teachers' ICT-infused practices are starting to inform research as well as the teaching community, it becomes important to focus on developing teachers' expertise in order to develop didactics: "An exploration of teacher knowledge is necessary in order to indicate the way in which teachers need to change, which has implications for implementation strategies" (McCormick & Scrimshaw, 2001:40). Recent studies of ICTs and innovative practices among teachers also point to teacher knowledge as the crucial factor when ICTs are appropriated by institutions (Yamagata-Lynch, in press; Zhao et al., 2002). What emerges is a relational perspective on didactics and teachers' expertise, a perspective that does not underestimate the changes in beliefs and practices that teachers have to experience in order to fully appropriate ICTs. This is a perspective that includes, but transcends a rational-empirical view of change that has resulted in an instrumental approach to technologies.

Based on the present study, two teacher-related concerns seem to become especially pressing if we want to integrate ICTs in education. Firstly, need to facilitate opportunities for teachers to engage in discourse communities that focus on the transformational potential of ICTs. *The Tower* course provides an example of how teachers came to reflect on their views of ICTs and pedagogical practices. However, the course also showed that such efforts are not self-sustained but must be collaboratively cultivated and supported by institutions and policy-makers. Secondly, it will be crucial to develop professional teacher identities that accommodate relational, distributed, and transformational perspectives on the technology-rich classroom. Teaching will take on forms of joint inquiry, and teachers will need to become researchers on their own practice since we still know too little about the practices evolving. This means that teachers will need to become *agents of change* since they are the ones closest to the practical manifestations of the above perspective. It is their situated expertise that may prove to be the most important factor in developing the didactics of the digital and networked learning community.

7. The EFL classroom in transformation

Men learn while they teach
Lucius A. Seneca (4 BC – 65 AD)

To teach is to learn twice
Joseph Joubert (1754 – 1824)

7.1. Introduction

According to Andy Hargreaves (2003:14), "The integration (or non-integration) of information and computer technology into secondary schools provides a striking example of the failure of ingenuity in educational change". The present study argues that this may not necessarily continue to be the case but that it takes more than we have realized to bring about such ingenuity. In sum, the present thesis argues that with the increasing impact of networked ICTs, the EFL classroom is profoundly transformed. The nature of the subject changes, learners' and teachers' relations to the subject change, and new relations between learners, teachers and artifacts emerge. *It is not enough to study a school subject, technologies, and didactics as separate fields, but where they converge and intersect. It is at the interface of the three that teachers appropriate technological artifacts, where their beliefs and practices are formed and transformed* (cf Figure 1.1 in Chapter 1.1).

In order to cope with transformation, teachers need to develop cultural appropriation of technologies. The previous chapters have tracked teachers who articulate their beliefs about ICTs, who practice in ICT-rich environments, and who appropriate ICTs through in-service training and by practicing in such ICT-rich environments. Beliefs, practices, and appropriation are always influenced, afforded, constrained, and mediated by the social and cultural contexts they are woven into. The present thesis argues that one such set of contextual factors (often referred to as 'traditional') is currently being challenged by a new set of contextual factors that emerge in the ICT-rich classroom. For teachers working at the interface of the two systems, change, transformation, and turbulence are the only constants. The result is a dynamic and complex ecology and one that will require very competent teachers in order to design and orchestrate activities that invite to mature participation. There is reason to claim that the complexity involved when ICTs are sought introduced into educational practices has been seriously underestimated. Partly this is because of a too simplistic and instrumental view of technologies, partly because focus has been directed at the learner, the technology, or the teacher as separate objects of study instead of the *social relations* that develop between the three.

There is an emergent body of research literature on such relational issues. A survey of the bibliography in the present thesis shows that except for a few classic references (mostly within the Vygotskian tradition) the titles have been published quite recently. This is an indication of a field in the process of constituting itself. What we see up close is an ongoing social construction of this compound field as described in Chapter 3; a school subject, the way ICTs influence it, and the didactic implications. These three elements provide the main interface at which teachers – as ICTs increasingly make an impact – will have to exercise their expertise.

The present study has argued for an organic, multilevel, and holistic approach to the phenomenon of teachers' appropriation of ICTs. Therefore it seeks to avoid listing findings in

terms of discrete items. However, observations apart in time and space form a picture where we see certain features becoming more salient than others. These features are subsumed under the following section titled *Outcomes*. Chapter 7.2 (below) is the present researcher's interpretation of what insights relevant to the research questions this study has produced. While many observations have been presented in connection with the consecutive chapters, Chapter 7.2 discusses the observations in a more principled and theoretical perspective. This discussion is followed by an assessment of how valid the interpretation is. Next, the present study's contribution to the field (as described in Chapter 3) is considered before turning to the possible implications of the study. The chapter ends by discussing further research.

7.2. Outcomes

In the present study we have come to see how transformed practices emerge in ICT-rich classrooms. Such emerging practices are driven by the tensions between two activity systems. In the first system, the goal is to make learners familiar with existing knowledge in the form of curricula and school subjects. This is an aspect of disciplinary reproduction and enculturation. In the second system, the goal is to prepare for complexity and uncertainty associated with a globalized, fast-developing and diverse society that produces challenges we may not yet fully realize. In such a system knowledge is constructed and developed through interactions that increasingly make use of digital and networked technologies to facilitate joint solutions. This is an aspect of transformation and innovation. Such processes have so far evolved only to little extent in school practices but more so in out-of-school practices, embedded in learners' lifeworlds. Both systems are crucial for education in the 21st century.

At the interface of the two systems we need to develop a relational didactics (cf Chapter 3.11) and teachers' relational expertise (cf Chapter 6.10) to take advantage of the potential 'third spaces' (cf Chapter 6.4.7) that emerge. We need a substantial amount of further research in order to develop a (subject) didactics for technology-rich learning environments. The contribution of the present study is found in its focus on how teachers think about and practice with ICTs and, thus, how they come to appropriate such technologies. As presented in Chapter 1.2, the fundamental research question driving the present study is:

- **In what ways are ICTs appropriated in the EFL classroom?**

Three supporting questions were asked in order to target certain aspects of the appropriation processes:

1. What are some of the beliefs and attitudes of teachers of English who encounter ICTs in their profession?
2. What kind of educational practices emerge when teachers of English integrate ICTs in their classes?
3. Under what conditions do we see innovative practices emerge?

In the following these three questions will be dealt with separately before returning to the main question above.

7.2.1. Beliefs and attitudes

Teachers' beliefs about and attitudes toward ICTs amount to *conceptual* appropriation of such technologies. This dimension of appropriation was analyzed through *The Tower* survey in Chapter 5, but it can also be seen in teachers' practices in ICT-rich environments. In both cases, the study addresses *emerging* attitudes and beliefs; how teachers' conceptualization of

technologies emerges through their participation in an in-service course. Consequently, such beliefs and attitudes must be regarded not as fixed properties but as continuously developing understandings of what ICTs mean in teachers' professional lives. In addition, such beliefs and attitudes are formed under certain socio-political conditions and certain educational superstructures and discourses. With these conditions in mind, the polyphonous voice emanating from *The Tower* survey can be heard to articulate the following:

- There is a widespread belief that classroom practices change with the integration of ICTs. Such transformation is most often attributed to learner empowerment and lack of teacher control in the sense that learning processes become less predictable. New types of tasks and activities emerge as well.
- There is a clearly expressed need for professional development, particularly in forming communities of colleagues around emerging practices and new insights in learning and teaching.

The above two items point to a connection between challenges found in transformational processes and a possible answer in the form of professional development and in collective and collaborative approaches to change. Lack of control does not refer to classroom management issues as much as lack of control over the school subject, which in ICT-rich environments may appear in unpredictable shapes and contexts. Consequently, professional development and organizational alternatives can be seen as a response to such concerns. When it comes to *The Tower* participants' view of technologies and their own roles when integrating technologies, the following items emerge as salient:

- There is great diversity of beliefs and attitudes, reflecting the complexity of coming to terms with and appropriating ICTs. The lack of salient categories, however, reflects a multitude of beliefs and how individually prioritized categories differ across *The Tower* sample[171].
- Resistance or negative attitudes towards technologies as such are non-existent. Where negative attitudes are expressed they concern the lack of institutional support and disillusionment brought about by disinterested colleagues.
- Positive attitudes are found in connection with what *The Tower* participants see as the short distance from the course to their own practices. The course facilitates their own efforts of integrating ICTs; the innovation process is situated in their profession as teachers of EFL.
- Instrumental mastery of ICTs is a primary concern. However, issues of didactics, pedagogy, and theoretical input are also salient to the extent that there is reason to consider instrumental and theoretical competence as mutually constitutive in the appropriation processes.
- *The Tower* teachers believe that they have valuable expertise to offer when ICTs are integrated. This expertise concerns primarily the subject taught but also the way a subject is taught, i.e. didactic issues. There is hardly any indication of marginalization, loss of professionalism or identity.
- *The Tower* sample experience their position as working at the interface of two complementary environments; offline and online.

[171] Murphy (2000) also points to the heterogeneity of teachers' beliefs regarding foreign language learning in online environments.

The collective beliefs and attitudes summarized above are highly relevant for further integration of ICTs, and they hold potential for innovative practices. Through participating in *The Tower*, these teachers have negotiated their way towards an understanding of how ICTs may affect their school subject as well as their professional efforts and standing. Their beliefs and attitudes are the result of them engaging in practices across offline and online settings that involve familiar as well as new colleagues. Keeping the *Hawthorne effect* in mind, as well as the relative novelty of the technologies, it would seem that the teachers who completed *The Tower* course can be seen as focusing on the affordances and transformational potential that emerge when ICTs are introduced in the EFL classroom. This *Tower* focus differs from the one found in courses that target instrumental skills, particular types of ('educational') software, or more general, 'transferable' skills such as e.g. word processing.

However, the move from beliefs and attitudes to a successful integration of ICTs, from instrumental and conceptual appropriation to cultural appropriation, may still be a long one. Constructive, relevant and future-oriented practices do not automatically emanate from ideas alone. In the beliefs summarized above there are elements of compatibility as well as incompatibility with innovative practices, of convergent as well as conflicting issues. For instance, *The Tower* sample's communicative approach that includes constructivist as well as socioculturally oriented beliefs, is compatible with the epistemological affordances found in networked ICTs (cf Chapter 2.2.7) as well as the ontological and epistemological implications of a sociocultural perspective (cf Chapter 2.2.7). Such issues, however, are hardly touched upon in in-service courses. In-service courses that aim at integrating ICTs in EFL teachers' practices need to be embedded in a theoretical perspective that seeks to bridge educational theory and practices of language learning and teaching.

As for conflicting issues, the most salient example is the mismatch between what *The Tower* teachers see as potential for transformed practices and the conditions under which they are to be put into practice. For example, the time factor is the number one reason teachers dropped out of *The Tower* course. Those who completed organized their (extra) work through collaboration, which suspend constraints of time. Time in this context equals time to cover the curriculum of the school subject, to prepare for exams, to cope with increased bureaucracy. It would take a lot to challenge such fundamental institutional issues, and this might explain the frequent laments about lack of support from the school and colleagues who remained 'traditional'.

In *The Tower* survey and discussion forum, beliefs emerge as social constructions, as the outcome of people's experiences with, and subsequent hypotheses about technologies. Beliefs, in a sociocultural perspective, come about through interaction with the world, through socialization, enculturation, and not as the result of internal mental processes. Beliefs are always situated. Changing beliefs, thus, is not just a question of persuasion and argumentation but of contextual affordances that are conducive to changing mindsets and attitudes. If contextual issues are not considered as crucial to changing beliefs, disappointment, frustration, and resentment may be the result. Such sentiments are also found in *The Tower* sample.

The teachers who make up *The Tower* construct their beliefs at the interface of the confidence instilled by tradition and the uncertainty of the future. Theoretically, ICTs challenge notions about learning as individual cognitive efforts, knowledge as fixed and quality controlled (e.g. in the form of textbooks), and teaching as facilitating the acquisition of such – all time-honored elements of schooling. Contextually, ICTs challenge the way learning and teaching

have been subject to compartmentalization; as subjects, in time slots (e.g. daily/weekly sessions), and in co-located settings (classrooms). The tensions that emerge shape teachers' beliefs, attitudes, and (lack of) expectations. In these tensions we may find the reason why in-service courses, R&D projects, and even large-scale programs for ICT integration fall short of expectations. At the same time these tensions also hold the seeds of changed beliefs and attitudes. It is in these tensions we see the beliefs of *The Tower* participants originating. But an in-service course is insufficient for seeds to take root (cf Lemke's discussion on how points in time add up to social lives, Chapter 6.2). Sustained change needs sustained practices that accommodate the above challenges. Consequently, the question of emergent beliefs must be seen as complementary to and relying on practices that are sustained over time.

7.2.2. Practices

Beliefs and activities are reciprocal in shaping the more longitudinal practices of the ICT-rich learning environment. The sessions analyzed in Chapter 6 are designed by teachers who, by way of *The Tower*, embody many of the beliefs summarized above. Nevertheless, their individual classroom experiences may add up to a more persistent influence on their attitudes to ICTs than an in-service course may have. The reason is found in the dimension of the appropriation processes referred to as *cultural* appropriation (cf Chapter 2.3.5). *The Tower* might have provided opportunities for nominal, instrumental, and conceptual appropriation. However, there was no guarantee for cultural appropriation; that teachers would actually explore and exploit the affordances of ICTs to transform their everyday classroom practices (although the response to the survey suggests this happened).

In the case of the three teachers at Mercator and Minerva, we see professionals who – with different histories, cultures, and from different positions – all illustrate transformational aspects of ICT-infused activities to the extent that their practices deviate from those where ICTs are not integrated. The question that arises is what kinds of practices that emerge. The patterns that surface from analyzing instances, episodes and sessions at Mercator and Minerva can be summarized as follows:

- Learning is designed as activities that involve humans and artifacts and that interact in a variety of (unpredictable) ways. Affordances and constraints (organizational, technical, social) influence the nature of the design.
- Activities are located at the interface of offline and online settings, and the two are seamlessly interwoven.
- Important elements of the activities (usually triggers) are 'externalized'; i.e. they materialize in the form of web pages with resources or instructions, email messages, and fictitious provocateurs ('haifaiv'). As such, these elements serve an indirect and pro-active role in the overall design.
- Designs are brought to life in the classroom through orchestration; i.e. how learners, teachers, and artifacts are organized and continually reconfigured around activities. For the teacher this involves exploiting the externalized elements (referred to in the previous item) as well as reacting and responding to immediate needs and challenges.
- The mediating artifacts involved appear to play a complex role. From various positions (learners, teachers, policy makers, producers) they are instilled with certain expectations and intentions; they are approached from different cultures-of-use. Their material qualities, the *genotype* qualities, are sought aligned with the user's lifeworlds, thus changing the artifact to meet their goals. This involves the *phenotype* qualities of the artifact in the appropriation processes (cf Chapters 2.3.3 and 6.4.6).

- Out of the design and its orchestration new social spaces may emerge and extend the zone of proximal development. In these spaces, activities and goals may be multiple and they may be transformed according to the empowerment and agency exercised. Consequently, cultural appropriation is afforded to teachers as well as learners. On the other hand, if the zone of proximal development is not extended, practices tend to remain more traditional (cf designs that rely on prescribed links and web pages at Minerva). The complexities involved in designs and orchestration can easily be underestimated; observations from Mercator and Minerva both show how teachers struggle to find the right balance between overt instruction, intervention, and subtle guidance. In the new social spaces that ICTs have the potential of creating, the IRF sequence is complemented by, and quite often supplanted by, or subsumed under, IDRF variations. Teachers who are used to the traditional, IRF-oriented classroom may experience these as 'lack of control'. However, the ICT-intense sessions observed show that IDRF variations also provide opportunities for collective commitment and a larger repertoire of communicative practices (cf Chapters 4.7.2 and 6.10).
- The social spaces are populated by teacher and learner *roles* that include expectations from institutional discourse, as well as *identities*, i.e. how participants understand their own individual experience and how they construct their selves (cf Chapter 5.5.2). The lived authenticity brought into the social space along with the multiliteracy required in ICT-rich environments may open up for new, jointly developed scripts.
- Such new scripts or 'third spaces' (cf Chapters 3.10 and 6.4.7) offer opportunities in which teachers as well as learners engage in practices that involve learning as well as teaching. Such opportunities may not always be recognized and teachers may feel somewhat uncertain how to approach and take part in developing joint scripts and third spaces. How a school subject may materialize and be pursued in third spaces emerges as one of the more intriguing areas for further research.
- Opportunities that are recognized may inform the next design; thus there is a cyclical development in the processes described. This comes close to The New London Group's (2000) notion of the *Redesigned* (cf Chapter 3.11).
- The above relational and transformational processes all contribute to teacher's appropriation of technologies. Such appropriation is considered a premise for developing the kind of teacher expertise discussed at the end of Chapter 6.10.

The points summarized above are illustrated graphically and as a process in Figure 7.1 below (inspired by Kennewell, 2001 and Wells, 2002). It serves as a portrait of emergent practices in the ICT-rich EFL classroom.

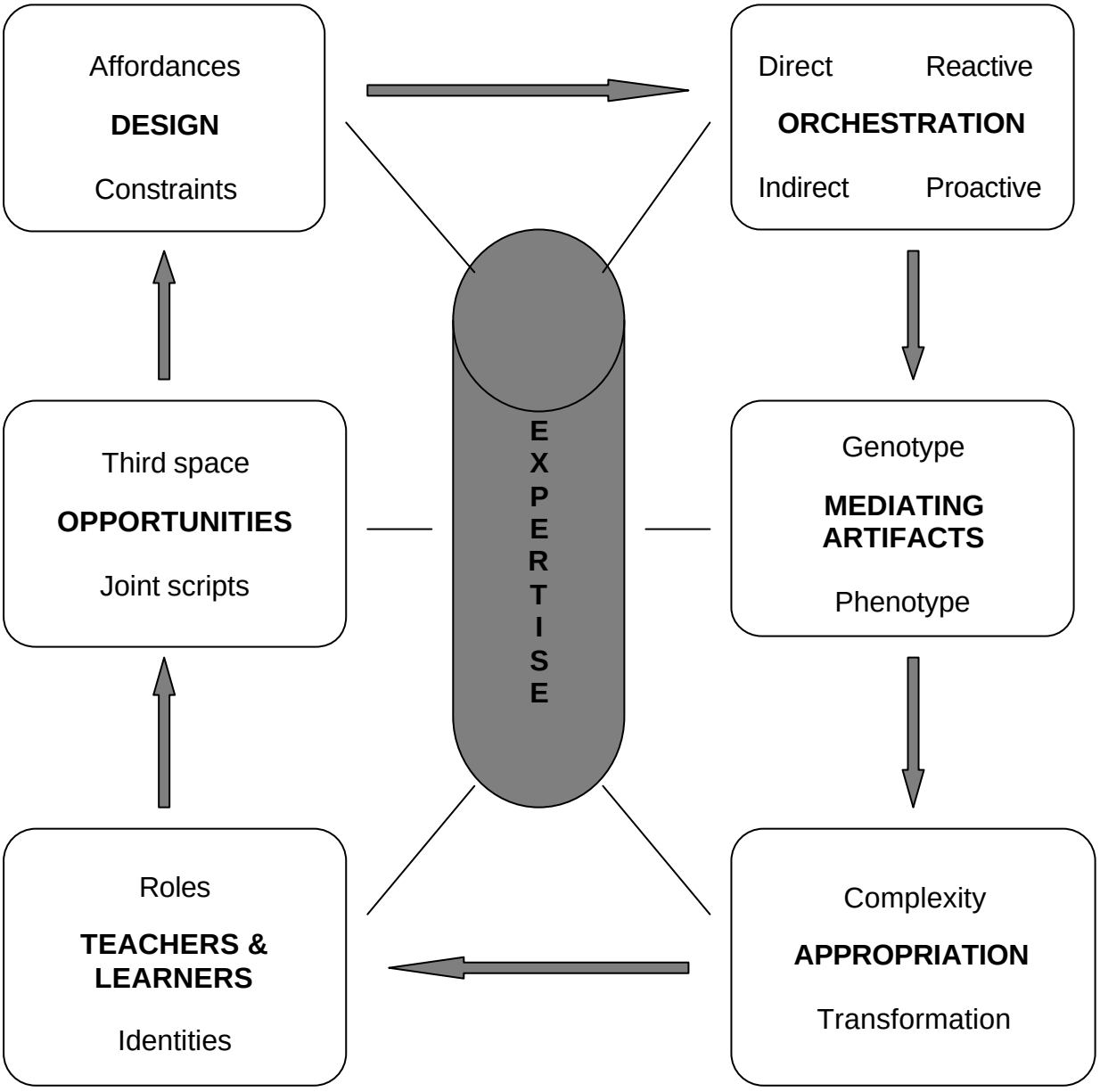


Fig 7.1 Teaching in an ICT-rich environment. Abstraction of constitutive processes as described in Chapter 6.

Figure 7.1 is in no way meant to illustrate a linear or causal process with a joint script as the pre-determined result. Rather, the figure should illustrate the potential for rich interaction that might materialize under certain conditions. In the case of teacher Tom we see how his contributions become part of collective interaction, he does not just initiate or follow up moves as in the common IRF sequence. In these interactions "shared moments together add up to social life" (Lemke, 2000:273), and teacher(s), learners, and artifacts meet in activities. In doing so, new participatory structures develop that are not only richer but more complex as well. The data from the observed classes show how teachers are socialized into and (therefore) act out 'institutional scripts', while learners bring the scripts of their lifeworlds into the classroom. Both parties have problems in merging the two and making them into a joint script that captures both enculturation and transformation. However, it seems that such opportunities and their manifestations occur more frequently when online settings become an integrated extension of the classroom.

Many of the processes illustrated in figure 7.1 will reciprocally inform each other, and the experience of a joint script may, in turn, inform the next design. Thus, the figure should be read in cyclical terms more than the one-way arrows would indicate. As an attempt to capture some of the many and often ephemeral processes that constitute teaching and learning EFL in ICT-rich settings, the figure might serve as an artifact that captures continuous variation. It might help educators unveil, analyze, and interpret didactic processes where ICTs are integrated and serve as a mediator between 'traditional' and emerging practices.

Another emergent practice is found at an organizational level. *The Tower* sample (cf Chapter 5.9.1 on participation) and teachers, learners and staff at Minerva show how emergent and transformed classroom practices need a collaborative institutional response. For instance, Marie's practice changes through participating in a learning community, i.e. she is apprenticed into ICT-rich practices. The result is seen in her designs that started out as textbook dependent but developed into the more open, risk-taking designs so typical of Helen and Tom. If we want such practices to be included in the repertoire of teachers, the data from the present study show that we need to develop local, supporting structures. The alternative is the solitary practice that makes an innovative teacher like Tom survive but whose local ownership is not extended to reach the broader community at Mercator.

7.2.3. Conditions for innovation

The present study has sought to answer the research questions raised by using a sociocultural lens. This lens focuses on individuals, collectives, and their environment as mutually constitutive of human conduct. Consequently, a 'typically' sociocultural angle will be to examine under what conditions we see innovative practices emerge. Clues are found in the responses from *The Tower* sample but even more so in the practices observed.

The practices that may show innovative potential rupture the traditional organizational model of one particular subject taught for a fixed number of minutes, at certain predetermined times, and its accompanying tests and exams. A case in point is the transatlantic project at Minerva. Depending on learners and teachers meeting at odd hours, with the extra work involved, and with curricular considerations looming in the background, it is not hard to see that what is potentially an authentic and rewarding cross-cultural experience proved difficult to sustain. In many ways, this Minerva project exploits how ICTs may contract place and time; the *heterotopy* and *heterochrony* (Lemke, 2000) offered by the particular artifact of networked ICTs. But as they do so, we also see how the traditional organizational model does not easily accommodate practices that require online activities.

Some conditions for innovation that emerge from the present study are summarized below.

- *The Tower* survey points to the importance of the situated nature of ICT integration. With high scores on relevance, applicability, and appropriation the course seems to have presented participants with opportunities for professional development. A purely technological approach to ICTs is insufficient at best.
- *The Tower* survey points to the importance of teachers being part of an informed discourse community. This is underpinned by the greater rate of completion among those who collaborated as well as the nature of the online forum. If ICTs are to achieve their potential as artifacts conducive to educational change and innovative practices, we need to systematically build and sustain such discourse communities among teachers.

- *The Tower* survey also points to lack of time and support as primary constraints. There is a need to reconsider the chores that teachers are expected to carry out as well as how these chores are organized.
- The practices observed at Mercator and Minerva that may point towards innovative and future-oriented teaching and learning do not emerge as the result of technologies alone, or only by force of the competent teachers involved. Emerging practices need to be supported and sustained by social, institutional (organizational), and political superstructures. This is also one of the more salient concerns of *The Tower* sample.
- Teachers' expertise is a crucial element for innovative practices. Such expertise is relational – the ability to realign humans and artifacts around meaning-making and future-oriented practices (cf Chapters 3.11 and 6.10). Beliefs uncovered through *The Tower* survey as well as classroom observation show that given the right support, such expertise can be developed.
- Conditions for innovation also include the right distance between the innovation and the tradition from which it diverges. For instance, Helen and Marie's ambitious transatlantic project stretched the limits of what was possible. There is a pain threshold as to what is sustainable if fundamental, organizational constraints are not sought overcome at institutional and policy levels. In the case of Mercator, the new style exam and triple sessions support change. In the case of Minerva, portfolio assessment, collaborative approaches and attempts at suspending constraints of time (by extending the school hours) also function in a supporting role. The implications are that we need to develop robust organizational/institutional support for teachers who exploit the potential of online extensions. This potential simply cannot be fully realized within the single subject and single session model. We need to develop learning situations where complex problems are approached from a cross-curricular position and across flexible timescales.

The above items, as well as Figure 7.1 (above) point to persistent tensions between a system of emerging practices and a system that carries a long institutional-organizational heritage. At the interface of the two we see a dialectic relationship of traditional (thesis) and transformational (antithesis) practices and with a third space as the potential synthesis. For these spaces to prosper, however, impediments in the traditional system will have to be conquered. As schools are socially and culturally constructed institutions, the way they arrange conditions for teaching and learning are manifestations of how they think about (or ignore) urgent educational issues.

7.2.4. Appropriation and transformation

By examining beliefs, practices, and the conditions under which they emerge we come closer to answering the overarching research question:

- **In what ways are ICTs appropriated in the EFL classroom?**

To the present researcher, the answer is found by examining *how the underlying activity system of 'teaching' is transformed*. This transformation poses certain challenges for teachers who aspire to integrate ICTs in their work. Appropriation is closely linked to transformation; we colonize the alien artifact and instill it with intentions relevant to our own use. It follows that appropriation of an artifact is closely linked with the function the artifact has for the user. Failed appropriation does not necessarily mean 'failure' to integrate the artifact but that its value is not sufficiently acknowledged. Consequently, there is no process of transformation. Also, appropriation is a social and cultural process. The present study argues that for

innovative and future-oriented educational practices to emerge, we have to address appropriation and its social context as a unit.

In the case of the EFL classroom, three dimensions of transformation (see below) appear to be closely linked to teachers' appropriation of ICTs, and especially those that are labeled 'cultural' (cf Chapter 2.3.5). These dimensions address changes that take place at the very heart of educational endeavors:

- *The school subject of EFL itself is undergoing change*. The nature of the subject taught has a direct bearing on appropriation processes. With networked ICTs, new participatory genres emerge as socially constructed conventions. These are currently developing and have not yet become well-established communicative forms on par with e.g. the business letter or the scientific essay. The result is that ICT-rich environments afford opportunities for authentic, diverse, mature practices to a greater extent than in non-ICT classrooms. Thus, the distance between school and out-of-school practices is reduced. Moreover, such practices are closely tied to epistemological perspectives (cf Chapter 2.2.7) as they entail a view of EFL as situated and contextual, both in human and technological terms: Cultures and technologies both influence what counts as functional and valid English in the 21st century. The consequence is also that the ontological position of EFL changes. Instead of locating the discipline within a linguistic system to be acquired, it is located in practices that are constantly being shaped and reshaped through a constantly increasing number of people who engage in global and online Englishes. It would seem that for cultural appropriation to take place in the EFL classroom, such epistemological and ontological implications need to be made visible for teachers. They have consequences for what we consider 'acceptable', functional' etc practices and how we assess such practices.

- *The social spaces (both in terms of time and place) for EFL practices are extended*. As EFL practices and content increasingly become 'externalized' in distributed networks and other digital artifacts (e.g. Personal Digital Assistants [PDAs], Learning management Systems, [LMSs]) new spaces are afforded. Teachers can proactively exploit such new spaces by making designs for learning at the interface of offline and online environments. Communicative conventions are currently emerging in these spaces and teachers need to take part in developing them in order to serve as experts or mature users. If not, they risk becoming marginalized and abdicating their position. By populating and colonizing new social spaces, teachers and learners bring their lifeworlds, their cultures-of-use into them and, consequently, a potential for a shared script or 'third space' emerges. The processes that lead towards new social spaces and possible shared scripts serve as rich opportunities for cultural appropriation.

- *Teachers must teach in ways they were not taught to do*. In ICT-rich environments we see the outline of communicative practices that should prepare learners for the future. For teachers, this means being committed to continuous professional development, e.g. by engaging in collaborative teamwork with colleagues, by fostering collective intelligences in the classroom, and by developing a capacity for risk-taking and transformation (Hargreaves, 2003). These processes involve learning and teaching as two aspects of an activity; the two cannot be seen as separate but only as two dimensions of partaking in educational discourse.

To summarize, appropriating an artifact will fail if it is not offered with its conceptual underpinnings, or removed from social context. Appropriation of ICTs is closely connected with the transformed school subject, with the added and different social spaces that emerge, and with the didactic shift that focuses on the relations in which the school subject enters more than how to realize the goals that frame the school subject in a 'traditional' curriculum. With the current emphasis on the curriculum as the primary steering document, this shift might prove to be a major challenge.

7.3. Conclusion: Interfaces

Chapters 3.13 and 6.5.3 argue that teachers find themselves at the interface of a traditional and an emerging activity system. What is more, teachers are constitutive elements of this interface as their practices in ICT-rich environments broker between the two systems; teachers are agents of cultural reproduction as well as cultural renewal. But this is an interface that has several dimensions. Through the previous pages, we have touched upon a series of dimensions, from ontology and epistemology (cf Chapter 2.2.7) to the compound and reconfigured school subject (cf Chapters 3.9.5 and 6.7), and the (uncertain) policies that surround the integration of ICTs (cf Chapter 3.13). Table 7.1 (below) lists interface dimensions involved when addressing transformation of the EFL classroom. It encapsulates major aspects (but leaves out subtleties) of what has been the primary metaphor driving the present study.

Table 7.1 Teachers at the Interface
Aspects of cultural reproduction and renewal

	Interfaces	
Aspects	Traditional	Emerging
Ontology	Dualist (mind/world), static	Non-dualist, relational interdependence of mind and world, 'lifeworlds'
Epistemology	Knowledge can be possessed through transfer and (individual) mental processes	Knowledge is situated, procedural, relational, collective, distributed over humans and artifacts
Literacy	A series of discrete functional skills to be taught (encoding and decoding)	Increasingly informed engagement in complex, diverse multimodal social practices; multiliteracy
Technology	Enhancement of learning and teaching	Transformation, potential new spaces for learning and teaching
EFL school subject	Defined by curriculum, standardized	Beyond the curriculum, diverse and not (yet) approved variants
Didactics	Supporting knowledge acquisition, loose connection with a theory of learning	Supporting knowledge production, interwoven with a theory of learning
Curriculum	Standardized, administered and controlled in the form of individual tests and exams	Negotiated with a view to 'real world' practices and controlled as capacity for mature, collaborative participation
ICT Policies	Promote skills (technical and pedagogic) that produce efficacy in learning and teaching	?

7.4. Issues of Validity

The present study is process-oriented and of a local nature, which is typical of qualitative research. This means that issues of measurability of data, replicability of the study, generalizability, and longitudinal consistency of description are not considered the principal criteria for the trustworthiness and authenticity (Denzin & Lincoln, 1998:277). Nor is this the case with the present study (cf Chapter 5.10 for issues of representativity regarding *The Tower* sample). However, issues of *validity* arise; i.e. to what extent the present study analyzes the phenomenon it intends to analyze, and thus to what extent the analysis can be considered "Quality of Craftsmanship" (Kvale, 1996:Chapter 13)[172]. In particular, the notion of

[172] According to Kvale (1996:252), "Ideally, the quality of craftsmanship results in products with knowledge claims that are so powerful and convincing in their own right that they, so to say, carry the validation with them (…). Valid research would in this sense be research that makes questions of validity superfluous". While this is indeed a seductive argument, the present researcher still feels the need to explicate some issues of validity!

ecological validity will be addressed; i.e. to what extent a researcher's analysis is consistent with the participants' analysis of a situation. The question that arises is validity for whom?

7.4.1. Ecological validity

Validity is, of course, not a universal constant but "a process shaped by culture, ideology, gender, language, and so on" (Denzin & Lincoln, 1998:278). Kvale (1996:251) extends "the concept of validation from observation to also include communication about and pragmatic effects of, knowledge claims". In the present study, pragmatic validation can be seen in how the activities of the three teachers observed accompany and illustrate the ideas, beliefs and approaches articulated in *The Tower* survey and discussion forum. The relationship between events such as *The Tower* course and classroom practices should also add to the *internal validity* of the study.

However, of particular relevance to the present study is the concept of ecological validity – "a concern with the setting or environment in which the research takes place" (Schmuckler, 2001:421). Ecological validity with its focus on environment, e.g. real-life contexts in which agents act on a regular basis, seems particularly well suited to a sociocultural perspective with its non-separation of individuals and environments. Schmuckler, who gives a detailed examination of the concept quotes Bronfenbrenner's definition, in which "ecological validity refers to the extent to which the environment experienced by the subjects in a specific investigation has the properties it is supposed or assumed to have by the experimenter" (op.cit.:412). The environments researched in the present study represent real-life situations for teachers, are sustained over time, include artifacts that are commonly in use, and provide opportunities for rich description. Such settings, devoid of externally inserted or artificial stimuli, should yield natural and representative response required for ecological validity. Hence, the two environments under investigation, *The Tower* in-service course and the ICT-rich classroom, should meet the requirements of ecological validity, although a self-selected sample may be said to violate the concept.

A second concern for ecological validity is its compatibility with the theoretical underpinnings of the study in question. As was discussed in Chapter 2, cognition through participation, mediated by artifacts is at the core of a sociocultural perspective. These characteristics are operationalized in *The Tower* environment as well as in the classroom practices analyzed. In both cases, teachers are studied as participants and agents in tool-mediated activities. Hence, the validity of conclusions and outcomes is supported by agreement between theoretical and methodological issues and the phenomenon examined.

As for *content validity, The Tower* survey and the analysis of the discussion group aim at capturing important aspects of participants' beliefs and experiences. It is, of course, an impossible task to account for *all* beliefs and attitudes involved when teachers encounter ICTs. The ones elicited for the present study are chosen because they might have explanatory power when observing other teachers in their classroom practices. Thus, the question of content validity also takes on aspects of *external validity* despite the distinct situatedness of other practices.

Finally, it should be noted that the present study does not represent only one possible *de*scription of a phenomenon. It is also an *in*scription in the sense that it is the creation of the researcher, *my* situated version of the world studied (Denzin & Lincoln, 1998:334), a result of the interactive relationship between the observer and the observed. It was written from the position that we, i.e. educationalists on all levels, need to rethink the roles of ICTs in the

classroom. Acknowledging the researcher's inscription as a presence means acknowledging elements of power and control over the account. These elements are discussed in Chapter 4.3 in terms of voice, signature, emic and etic perspectives.

7.5. Some contributions of the study

The main contributions of the present study are, of course, found in its answers to the research questions. However, a thesis also contributes something to the field of research in general, simply because it is the end product of a long and thorny struggle with data, methods, and theories. In Chapter 1.6.3 the intended relevance and significance of the present study were indicated. In the following, focus is directed at the theoretical, methodological, and empirical contributions that this study argues to have brought to the composite filed described in Chapter 3.

7.5.1. Theoretical issues

During the 1990s a sociocultural perspective gained momentum as a theoretical challenge to cognitive and individual perspectives on learning. However, the main impact of this perspective is primarily found in educational psychology and less within the field of didactics. Where ICTs are involved, the CSCL tradition has often adopted a sociocultural perspective. Regarding foreign language learning and teaching, a sociocultural perspective must be said to still play a modest role, although there are signs that this is changing (cf Chapter 3.5).

The present study has attempted to apply a sociocultural perspective to the fields of EFL, ICTs, and didactics and where they converge in classroom practices. In doing so, it has tried to instill the field of didactics with certain assumptions of knowledge and learning and to show that questions of ontology and epistemology become didactic concerns as knowledge increasingly becomes digitized and distributed. In the wake of networked ICTs, the ontology of a school subject is changing. As information is represented in distributed units of binary code it becomes more accessible, can be assembled and manipulated by users in innumerable ways, and thus appears less accountable[173]. Another aspect is that the distance between a subject matter as it appears in a formal schooling context and in the 'real world' is reduced. Practices in school come to resemble authentic practices in which the learner's lifeworld becomes a real asset. The uses of *NiceNet* at Mercator and *YahooGroups* at Minerva are examples of this. Also, the reduced distance means that complex research questions are within the grasp of young learners[174]. The epistemological implication is that learners relate to a school subject in new ways as they participate in giving it shape. Such future-oriented, exploratory, and creative efforts must, however, be balanced by the cultural heritage found in the discourse of a school subject. Teachers play a crucial role in making visible and sustaining this balance. On such a conceptual level the present study argues to have made a theoretical contribution to the field of didactics.

On a more detailed level, the present study has analyzed how humans, artifacts, and contextual factors interact over time and at the interface of offline and online settings. The use of a sociocultural perspective has been instrumental in reconceptualizing ICT-intensive practices in the EFL classroom. Such a perspective makes it possible to capture relations at

[173] How learners approach digitally represented information is of great educational concern. It is clearly beyond the scope of the present study, but should be pursued in further research on classroom practices.

[174] For example, the *Web-based Inquiry Science Environment (WISE)* < http://wise.berkeley.edu/> provide young learners with opportunities to collaboratively and cross-culturally examine and analyze scientific challenges and controversies. Some issues are*: What makes plants grow? How far can light go? Different perspectives on wolf population.*

several levels and how these are woven together. Such practices are complex and will over time form an activity system that challenges the traditional system. A sociocultural perspective makes it possible to describe and analyze the complexities involved and the inherent transformational potential. The use of constructs such as *lifeworlds, cultures-of-use,* the *genotype* and the *phenotype* qualities of the artifact etc makes it possible to perceive the intricacies involved in ICT-rich designs and how they are enacted through orchestration and diverse forms of participation. Through the lens of a sociocultural perspective it is possible to make visible the relational expertise teachers in the 21st century will need to exercise (cf Chapters 3.11 and 6.10). On this level, too, the present study argues to have made a theoretical contribution to the field of didactics.

A sociocultural perspective has also been used to span the separate fields of EFL, ICTs, and didactics and view their convergence in terms of the interface metaphor. The result has been a reconsideration of literacy and what it means to be literate today and in the near future. The social practices that emerge in the ICT-rich classroom signal the need for a *multiliteracy* competence as part of a didactic approach to EFL. Multiliteracy needs to become an integrated aspect of how we analyze the ICT-rich classroom. This is particularly important when the subject in question is a global language on the rise. However, with ICTs increasingly making an impact on all school subjects, such a cross-disciplinary and multiliteracy approach may prove valuable in analyzing how the learning of a particular subject is affected. The present study has attempted to enhance this aspect of the sociocultural perspective.

Finally, the construct of *appropriation* has been used as a *Leitmotif* throughout the present study and sought developed in some detail. The construct appealed to the present researcher because of its explanatory potential when examining how and why some teachers integrate ICTs and some do not. In sociocultural literature, the construct is often brought up but seldom in great detail or applied to a specific research objective. Rather, the appropriation construct has been used in general terms to characterize the relationship between agents and mediational means, particularly language (Wertsch, 1998). The present study has used appropriation as a key to understanding how teachers integrate technologies in the classroom and has, thus, aimed to operationalize the construct within a particular domain. This has been done by making use of several dimensions of the appropriation construct (cf Chapter 2.3.5). In particular, conceptual and cultural dimensions of appropriation have been developed in order to gain insight into how teachers develop their beliefs about and practices with ICTs. Appropriation takes place where artifacts offer functionality and value for oneself as well as for others and where these may represent friction. The present study argues that the construct of appropriation has been developed and applied to a line of research that facilitates analysis of transformation processes in the ICT-rich classroom. With ongoing change and development in language and learning/teaching approaches as well as technologies, the appropriation processes of teachers might be one of the major roads to explore in order to advance and improve our understanding of what goes on in the 21st century classroom.

7.5.2. Methodological issues

The Teacher as Interface is a study that is broad in its scope; it seeks to capture appropriation processes as they emerge in collective as well as individual contexts, how they are mostly *conceptual* in *The Tower* setting and *cultural* in classroom practices, and how such processes emerge in sociopolitical contexts with different opportunities and constraints. The mixed method approach of the present study is in itself not new, although not common within a sociocultural perspective. However, the way quantitative and qualitative methods have been

sought to complement one another may represent a suitable methodological approach when the researched phenomenon is complex.

The study has aimed at capturing a multi-dimensional view of appropriation processes. The survey has presented a 'snapshot', an accumulation of beliefs and attitudes aggregated in teachers over the time they participated in *The Tower* course but captured at a particular moment in time. Although descriptive statistical techniques have been used, the responses have also been viewed qualitatively as a polyphony of voices, captured in a particular genre. The survey made it possible to examine teachers' (mostly) conceptual appropriation of ICTs on a collective level after having participated in a particular discourse community.

The classroom observations have sought to capture the more longitudinal aspects of appropriation as they emerge in teachers' practices. As Figure 6.1 illustrates (cf Chapter 6.2), the time element has received considerable attention. The aim has been to capture levels of activity; horizontally in the form of consecutive sessions that add up a course or a term, vertically in the form of episodes and sequences and how these are enacted in different 'layers' where we see different configurations of learners, teachers, and artifacts.

The chronology of methods might have been reversed, i.e. we might have examined how certain beliefs and attitudes emerge from teachers' classroom practices. Although this would have given us a different view of conceptual appropriation, it might have missed out on the impact of the in-service course. The point is that the mixed method studies used in the present study serve to capture a richer image of the phenomenon, more refractions of the metaphorical crystal, than an approach using a single method could.

A social phenomenon does not appear on one level only. The present study uses a multilevel analysis (cf Chapter 4.7.1) to capture appropriation processes across individual, collective and institutional levels. The reason is found in the *sociogenetic* (cf Chapter 2.2.2) view of man, which is a fundamental assumption in a sociocultural perspective. This study seeks to illuminate how appropriation is contextually dependent and not a matter of individual cognition. A multilevel analysis makes this possible. Multilevel analysis should also have a potential when studying how literacies and school subjects are undergoing change, how such processes of change manifest themselves, and how people encounter such processes. These are cultural processes that would need a multilevel approach in order to capture such phenomena.

The issue of timescales is related to the issue of levels. We have seen how classroom activities manifest themselves over time and as different form of interactions in 'layers' where there are various configurations of teacher(s), learners, and artifacts (cf Chapter 6.2, Figure 6.1). The use of timescales and layers serves to illustrate how life in the classroom is socially complex and dynamic. It is insufficient to make 'snapshot' analyses since these will miss the links between actions that are separated by time but that are mutually constitutive of an activity. Learning, teaching, and appropriation are continuous in their nature and ideally we would like to analyze such phenomena over lifespans (and generations). The use of multi-level analysis and multiple timescales will serve such endeavors.

Finally, the question of recurrent phenomena and patterns and how they relate to the theoretical perspective arises. Avoiding a primarily inductive as well as deductive approach, the present study has made use of *abduction* (cf Chapter 4.5.6). This approach diagnoses phenomena in light of theoretical assumptions and principles; i.e. there is interplay between

the two. While this approach may blur the distinction between theoretically and empirically triggered findings and interpretations, it affords an intimate relationship between the two. This study argues that abduction can serve as a valuable research strategy when we want to analyze phenomena through a particular theoretical perspective.

7.5.3. Empirical issues

Any study is but a part of the larger mosaic of scientific progress. The field of educational research has generated gigabytes of empirical material from surveys, interviews, and classroom observations. So what might be the contribution from a single study that offers more of the same?

Firstly, there is not much data in the form of recorded interactions elicited from teachers' practices in ICT-rich environments. The micro-level properties of these data make it possible to track and analyze certain crucial decisions, 'teachable moments', and serendipitous incidents up close. Important spaces for participation and realignment of positions can be seen in such data, e.g. when Peter takes on the role of conference initiator and moderator (cf Chapter 6.6.1). Furthermore, the empirical material capturing the layers of activity adds to our picture of the richness unfolding in ICT-rich classrooms. Ideally, more learners hooked up with microphones and recording devices would produce an even more detailed tapestry of the multilevel activities observed. However, this was not practically feasible in the present study.

Secondly, the statistically processed data from *The Tower* survey have been discussed in relation to possible inconsistency with a sociocultural perspective (cf Chapter 4.5.3). The conclusion is that this type of data is secondary to the way data are 'perspectivized', i.e. seen as theory-laden and situated. If this line of reasoning holds water, it might mean that the predilection for qualitative data often found in socioculturally inclined studies could be augmented by data elicited by statistical methods. Educational issues, whether they are studied in the social ecologies of the classroom or in teachers' efforts to develop professionally, are such complex phenomena that all types of data should be considered. As an introductory quote to Chapter 2, Cohen and Manion (1994:16) were quoted as saying that "the early stages of a science must be dominated by empirical work (…) This is why (…) much of educational research is descriptive. Only as a discipline matures can an adequate body of theory be developed". The present study would argue that the empirical work presented in it adds to the development of a theory of education.

7.6. Implications and recommendations

A basic but relevant question that might follow any study would be *So what?* In slightly more sophisticated form, the above question might be rephrased, *What might be the practical relevance of the present study for educators?* Obviously, careful consideration is needed when attempting to answer this question, not least because the normative flavor will tend to dominate. Still, the question should be addressed, although briefly. There are a series of additional and pressing issues that could be raised but that are not directly linked to the questions posed by the present study (e.g. ICTs and democracy, social inclusion, gender differences, funding, contracts of service).

The Tower survey as well as the forays into classroom practices in Chapter 6 show that teachers' appropriation of ICTs needs to unfold within an educational discourse that supports it on several levels. The implication is that it is crucial to find out what kind of support and where to locate it. Some recommendations are outlined below, based on three levels that together delineate educational discourse:

7.6.1. Micro level (classroom)

Responses from *The Tower* survey as well as the classroom practices observed show how the EFL curriculum is reconfigured at classroom level. One could say that the teachers at Mercator and Minerva in many ways taught *beyond* the curriculum. When ICTs permeate practices and are not just add-ons to existing ones, we see fundamental transformation. Such transformation includes a re-conception of literacy, realignment of positions and agency, new spaces for participation, and proximity to diverse and authentic EFL practices. Well thought-out designs and careful orchestration of them are needed. This has implications for teacher education and in-service training courses:

- ICT-intensive designs and (as far as practically possible) orchestration of them should form the backbone of teacher education and development that aim at integrating ICTs. Such designs should produce affordances for EFL that help build learners' zones of proximal development (individual and collective).
- Designs must pay attention to two dimensions of education; enculturation into an existing discourse that centers on a school discipline (e.g. EFL) as well as transformational potential that prepares for emerging discourses by allowing for learners' cultures-of-use. ICTs offer opportunities for creating such designs but teachers will need support from institutional and academic quarters in order to make such opportunities materialize.
- ICT integration must be embedded in a theoretical framework that views the relations of humans, artifacts, and contextual factors as mutually constitutive of learning and teaching.
- In order to sustain innovative practices and make them more robust, teachers should become researchers on their own practices, i.e. action research should become an integrated element in teacher development.
- One of the more important aims of teacher development should be to foster relational and situated expertise (as described in Chapters 3.11 and 6.10).

7.6.2. Meso level (school)

Responses from *The Tower* survey as well as how Mercator and Minerva went about organizing their integration of ICTs show the need for changes at school level. Administrative support and collegiate spirit seem particularly vital in order to achieve more than a short-lived, project-related boost.

At the two schools, the three teachers observed all made changes in the way they organized their teaching. This came about either by grouping sessions into larger units or by going beyond 'normal' working hours. Therefore, there seems to be a need for greater flexibility with regard to the school subject and its allotted time that the current organization of schooling does not easily accommodate. The result is that teachers who want to exploit new technologies and introduce innovative designs are forced into 'private practices', i.e. they become beacons by virtue of their *Stakhanov* worker's approach. However, this is a fragile and basically individual solution to an organizational problem.

Another, and similar, issue is how the three teachers managed to cope with the added complexity. Teachers at Minerva tried to take on challenges by building on a collaborative approach that included teachers of the subject as well as technicians in the staff and ICT-savvy learners. In the case of Mercator, there was a quite different situation as the ICT-

competent teacher ran a mostly solitary practice. This can be seen as a survival strategy; teachers with the kind of competence that Tom displays will easily be exploited and experience burn-out if they are not allocated time to let their expertise benefit staff and administration (cf Erstad & Trandheim Røn, 1998). In both cases, the issue is one of sustained support and division of labor. The implications are that innovative practices cannot be separated from how contexts encourage, adapt to, or resist transformation at classroom level.

Implicated in the line of reasoning above is how the social and organizational issues supersede technical issues (often at the center of interest) when schools seek to integrate ICTs. This has implications for how schools should prepare for informed and sustained integration of technologies:

- Schools must develop a shared understanding of their underlying intentions and ambitions for integrating ICTs and not just refer to policy documents or jump on bandwagons.
- Staff engaged in ICT integration should be considered socializing agents as well as agents of change and not just teachers with added ICT proficiency.
- Staff engaged in ICT integration should be considered communities-of-knowledge builders.
- The three previous items point to a reallocation of chores and resources such as time.
- Schools need to develop social, organizational, and technical mechanisms (e.g. test types, marking procedures, portfolio assessment, Learning Management Systems) that are robust and flexible enough to support sustained innovation and risk-taking.
- Schools should see themselves as learning organizations where theory-informed and practice-oriented activities ('theory in action') converge in enculturation as well as future-oriented learning and teaching.

7.6.3. Macro level (educational policies)

The present educational discourse as found in the Norwegian EFL curricula, in national plans, in the organization of learning as discrete subjects in fixed time slots, and corresponding exams does not provide sufficient support for cultural appropriation of ICTs. When teachers are enculturated into a curriculum and exam oriented discourse while at the same time expected to integrate ICTs, tension arises. Two socially and culturally formed discourses meet; the first one as the 'official' and institutional artifact of a historical and political process, the second emerging as relations between learners/teachers, school subjects, and ICTs lead to a reconfiguration of didactics. The first discourse is characterized by being tangible, established, and normative, representing a mapped terrain. The second is characterized by being complex, elusive, and exploratory in the sense that it is emerging through cracks in the traditional discourse. The traditional discourse has an advantage in the sense that educators culturally reproduce it; it carries 'institutional legitimacy'. The emergent discourse has an advantage in that it engages in shaping current and future practices; in comparison to the former it carries 'practice legitimacy'. Currently, teachers who engage in integrating ICTs work at the interface of the two.

For teachers, it is difficult but of great importance to be able to negotiate between these two systems. Their identities are partly formed by an institutional discourse, partly by demands from an ICT-infused discourse. They do not readily find guidelines to negotiate and bridge such discourses. Instead, teachers are left to accept mostly instrumentally oriented in-service ICT courses and subsequent expectations to convert instrumental skills into 'improved performance' by learners as well as teachers. The alternative, to ignore the emerging impact

of and demands from ICTs, can find some legitimacy in current curricula. A consequence can be that teachers are tempted to disregard ICTs and preserve classrooms as isolated from the world outside. A more sophisticated position of such an approach is found in the wish for schools to represent a 'counter culture' to what is seen as a technocratic, superficial, post-modern, and restless world in dire need of time-honored values. In any case, the most important *transformative* aspects of ICTs risk being neglected and hence escape classroom practices. Educators and schools need support in order to manage the transition from traditional to future-oriented practices. There are many far-reaching restructuring implications. Leaving the 'counter-culture argument' aside, a few suggestions can be made on the basis of the above:

- The EFL curriculum needs to adopt a multiliteracy approach together with a greater sense of English as a multi-faceted global resource. Global English has no 'native speaker' (cf Chapter 3.3.1).
- The EFL curriculum needs to place the school subject in a more collective and collaborative framework. The reasons are found in changing epistemologies and the increased impact of digitized, networked technologies.
- We need continued development of exam and assessment types that embrace the changes in classroom practices we see emerging.
- Pooling of project results and cases of innovative (EFL) practices at schools. There is a body of untapped resources that needs to be assembled and analyzed, and results need to be disseminated.
- Teachers must not be restricted to the role of bureaucrats who merely deliver a curriculum and administer policies (Darling-Hammond, 1990; Østerud, 2000; Hargreaves, 2003 point to this as an increasing trend). Rather, teachers should be seen as professionals who teach beyond curricula and policies, who engage with the world and mediate between a constantly changing world and the classroom. Such a view needs to penetrate all aspects of pre- and in-service education and not just didactics.
- We need pre- and in-service programs that engage teachers as researchers on their own practices.
- We need pre- and in-service programs that address collective and collaborative knowledge building.
- We need pre- and in-service programs that are future-oriented and that develop the potential already existing in many schools.

7.7. Future research

The present study is broad in scope, which leaves room for more in-depth research to be done in a number of areas. Some appear as an extension of the implications presented above, while others relate to issues that would overtax the framework of the present study but might be relevant for the field addressed by this study. Some of the issues that might be pursued by researchers are suggested below.

- One line of inquiry might well be connected with curriculum development. This study has argued that the subject didactics of EFL will change, although it is still difficult to pin down in what ways. Further research along three strands could bring about an EFL curriculum for the 21st century:
    - We need research on the position and character of English as a school subject (including higher education) with regard to developments in the language in global and technology-infused environments. With increased diversity and

constantly evolving conventions and registers, is there such a thing as a standard for EFL? Is there an 'English-speaking culture'? Can a precarious balance between standardization and creativity be found?
    - The notion of literacy and multiliteracies has received increasing attention over the past years – what will it mean to be EFL literate in the (near) future?
    - When, as this study argues, the instrumental approach to ICTs is insufficient, how can ICTs find their way into an EFL curriculum that attends to the transformational potential of such technologies?
- A related theme might be to research how learners view the school subject of EFL in a networked world[175]. The outcome might assist teachers when they try to assess their learners' conception of the school subject and how the social construction of meaningful EFL practices can be negotiated.
- In the present study, teachers' relational and situated expertise has been promoted as a key to successful integration of ICTs. However, this is still a loose construct and more research on teachers' practices is needed in order to glean what counts as educational expertise in the 21st century.
- The present study has tried to capture more than one time scale in practices and appropriation processes. However, the study is restricted to timescales found in the classroom. More research is needed on how a sociocultural perspective can capture longitudinal practices and appropriation processes, e.g. over a lifespan.
- Finally, over the past years the research community has produced new insights into how learning and teaching are social and cultural in nature and on how ICTs serve as mediating artifacts within such an approach. However, it is an open question as to what extent and in what version such insights reach the practicing community of teachers as well as communities of policy makers. It would seem that with the accelerating development of ICTs it is essential to analyze the various discourses involved (along with their power bases) with a view of encouraging more unified, and thus more robust and sustained, efforts to make technologies serve educational ends.

Many of the above suggestions imply diverse types of design studies. In such studies, teachers could be involved since they have been identified as agents of change and since there is an inherent intention of changing an existing situation. The primary reasons are found in the vagueness of the (EFL) curriculum when it comes to ICTs, the mismatch between instrumental views of ICTs (ICTs as 'mere tools') and the way they influence and transform practices, and how curricula as well as policy papers, programs for ICT integration and teacher development need to be informed by current research.

7.8. Closing remarks – opening doors

In his introduction to a volume on teaching in the knowledge society, Andy Hargreaves (2003:xvii) makes the following bold assertion:

> *We are living in a defining moment of educational history when the world in which teachers do their work is changing profoundly, and the demographic composition of teaching is turning over dramatically. The vast cohort of teachers who entered the profession in the expansionist*

[175] This research issue becomes especially relevant in light of the work by *The Committee for Quality in Primary and Secondary Education in Norway* who submitted their report on June 5 2003. The committee consider English as well as "digital competence" to be among the five *foundational* competencies (and not restricted to *subject* competencies) along with literacy/numeracy, learning strategies and social competence. This (basically *multiliteracy*) re-orientation will influence the EFL classroom and challenge EFL teachers and deserves to be pursued in research.

> *decades of the 1960s and 1970s are retiring. Teaching is becoming a young person's profession again. Whoever enters teaching and however they approach their work will shape the profession and what it is able to achieve with our children for the next thirty years.*

Hargreaves' perspective of teaching embodies social, formational, and future aspects of the teaching profession. The responsibility of realizing such aspects rests squarely on the shoulders of a new generation of teachers. This is an interesting and perhaps quite daunting situation for prospective educators. If a large-scale replacement of teachers is due (and the demographics of the Norwegian teacher population suggests it is, cf Chapter 5.4.2), the new generation of teachers will find themselves at the interface of cultural reproduction and renewal[176]. They will not only be entrepreneurs and executors of approved policies but also activists and agents of change, i.e. people who persistently inquire into and research educational practices (Sachs, 2001). In this capacity, *teachers will themselves constitute an interface between tradition and innovation*, cf the title of the present study.

Future-oriented practices will largely have to be developed by this generation of teachers. To do so they will need support from decision makers and researchers alike. Also, they will need a perspective that unifies human cognition and social practices in order to make sense of the transformational potential of developing technologies. This professional development will be situated in and found across classrooms, discourse communities, and the field or subject(s) they teach and as technologies continue to make their impact on education, classrooms, communities, and subjects will be transformed. The primary educational goals of the 21st century might well be learning to *become* and learning to *be* in an age when technologies and humans form an increasingly symbiotic relationship. Teaching and learning English (as a foreign, global, and networked language) will be closely related to such issues of social identity. Technologies influence language production, our use and understanding of language, and how we are socialized through taking part in communicative activities. In short they transform important aspects of our social lives. EFL educators need to appropriate technologies from a social and relational perspective. The present study has been written with such an approach in mind.

[176] For instance, the research and writing that went into the present study coincided with a large-scale project of reconfiguring teacher education at the Department of Teacher Education and School Development, University of Oslo. At the heart of the project are ICT integration, case-oriented tuition, and portfolio-based assessment.

Appendices

APPENDIX 1: Survey: ICTs in the English classroom

Note to Tower participants:

The following survey is part of a research project on teachers of English and their roles in an ICT learning environment. What the survey reveals will be used to benefit both teachers in service and teachers in training.

This is **neither** an evaluation of The Tower (*Språktårnet)* **nor** of you – the participants. Therefore, it is important that you answer the questions **whether you completed the course or not** and regardless of your performance. Your views and experiences are the important information that will be the subject of analysis.

All information will be treated confidentially in accordance with rules and regulations from the Norwegian *Datatilsynet* and the survey has been approved by *Norsk samfunnsvitenskapelig datatjeneste.*

Throughout the questionnaire the following abbreviations have been used:

- ICT – Information and Communication Technology
- EFL – English as a Foreign Language

Thank you for your co-operation!

Sincerely,

Andreas Lund
Department of Teacher Education and School Development
University of Oslo

Introductory facts (tick off)

1. Gender

___F ___M

2. Age

___years

3. Number of years as a practising teacher:

___years

4. County

___Aust-Agder
___Finnmark
___Hedmark
___Oslo
___Sør-Trøndelag
___Telemark
___Troms

___Hordaland ___Vest-Agder

___Nordland ___Vestfold

___Oppland ___Østfold

Section 1 Participation

5. I signed up for the course because

Note: Rank the four most important reasons by giving them numbers from 1 to 4.

___a) my school administration wanted teachers to take part

___b) my teacher colleagues wanted me to take part

___c) I was afraid I would not be up to date if I did not participate

___d) I thought ICT literacy might increase my professional status

___e) I wanted to increase my qualifications for the future job market

___f) I wanted to learn about new technology

___g) I wanted to learn about ICT-approaches to language learning

___h) I wanted to be part of a network of English teachers

___i) I thought ICT might ease my workload

___j) I was curious

___k)other reasons, which?_____

_____

6. Did you complete the course?
(Definition of completed course: 5 out of 7 topics and minimum one entry in the discussion forum)

___Yes ___No

If "Yes", proceed to questions 9 - 25.
If "No", proceed to question 7 and 8 and then stop.

7 I did not complete the course because:
(Definition of completed course: 5 out of 7 topics and minimum one entry in the discussion forum)

Note: Rank the four most important reasons by giving them numbers from 1 to 4.

___a) I did not find the time

___b) there was not sufficient or available equipment

___c) there was not sufficient support from my school

___d) the technicalities were too difficult

___e) I felt there would be too much work trying to integrate ICT in my class(es)

___f) as a teacher I do not feel comfortable using ICT in class

___g) I did not see its relevance for my work as a teacher of English

___h) I did not see any potential for ICT in language learning

___i) I did not agree with the approach in the course

___j)other reasons, which? _____

_____

8. ___I worked (mostly) on my own at my school

___I worked (mostly) with colleagues at school

9. I completed the course because:

(Definition of completed course: 5 out of 7 topics and minimum one entry in the discussion forum)

Note: Rank the four most important reasons by giving them numbers from 1 to 4.

___a) I felt I was obliged, it is a matter of principle to me

___b) I wanted to learn about the technology

___c) I saw new opportunities in teaching and learning English

___d) I felt the course to be relevant for my work as a teacher

___e) I was able to use course content (ideas, tips, articles, discussions...) in class

___f) I gained theoretical insight in my field as a teacher of English

___g) I felt I improved as a teacher

___h) I felt my role as a teacher changed and I liked it

___i) I got to know fellow teachers in the field

___j) it was fun

___k) other reasons, which? _____

_____

10 ___I worked (mostly) on my own at my school

___I worked (mostly) with colleagues at school

Section 2 Content

Note: Circle the value to say whether you "fully agree", "partly agree", "partly disagree" or "fully disagree".

11. I found the following topic(s) to be very relevant for me as a teacher of English:

___a) Topic 1: Information Retrieval
fully agree partly agree partly disagree fully disagree

___b) Topic 2: Use of Support Programmes
fully agree partly agree partly disagree fully disagree

___c) Topic 3:Problem-based Learning
fully agree partly agree partly disagree fully disagree

___d) Topic 4: Communication and Co-operation
fully agree partly agree partly disagree fully disagree

___e) Topic 5: Pupil Autonomy
fully agree partly agree partly disagree fully disagree

___f) Topic 6: Presentation and Publication
fully agree partly agree partly disagree fully disagree

___g) Topic 7: English for Special Purposes
fully agree partly agree partly disagree fully disagree

___h) The Discussion forum
fully agree partly agree partly disagree fully disagree

Other parts, which? _____

Section 3. Outcome

12. The course had the following effects on me:

Note: Rank the four most important reasons by giving them numbers from 1 to 4.

___a) No/Little effect, because I was already familiar with ICT in EFL

___b) I still cannot integrate ICT in my work as a teacher

___c) I can integrate basic ICT like word processing, email and Internet surfing in my work as a teacher

___d) I can integrate software and Internet services in my lessons according to my needs

___e) my role as a teacher has become more meaningful

___f) my work as a teacher has become more difficult

___g) I am part of a network of teachers

___h) I see new possibilities for pupils improving their proficiency in English

___i) I do not see ICT improving pupils' proficiency in English

___j) I believe ICT is not as important as many would like us to think

___k) I believe ICT will have a profound impact on the way we live, learn and think

___l) other effects, which? _____

_____

13. I believe the use of ICT in EFL has the following effects:

Note: Rank the four most important reasons by giving them numbers from 1 to 4.

___a) ICT is motivating for the pupils

___b) ICT empowers the pupils

___c) ICT makes pupils collaborate more than before

___d) ICT causes more in-depth learning

___e) ICT causes more superficial learning

___f) ICT results in plagiarism

___g) ICT increases reading skills

___h) ICT increases writing skills (discourse competence)

___i) ICT makes pupils write more English than before

___j) ICT increases pupils' vocabulary

___k) Hypertext is confusing for the pupils

___l) ICT demands new types of tasks and activities

___m) other observations, which? _____

_____

14. My general view of ICT in society is that it is

Note: Rank the four most important reasons by giving them numbers from 1 to 4.

___a) a tool for writing and information gathering
___b) a tool that makes learning more effective
___c) an extension of the classroom
___d) a world outside the classroom
___e) a learning environment for new insights
___f) an arena for communication
___g) a meeting place for humans and technology
___h) an integrated part of our lives
___i) a representation of knowledge
___j) other views, which? _____

_____

15. In the English classroom, I see the role of ICT as

Note: Rank the four most important reasons by giving them numbers from 1 to 4.

___a) facilitating formal language skills
___b) facilitating learning about the English-speaking world
___c) facilitating process writing
___d) facilitating Problem Based Learning (PBL)
___e) facilitating pupils' own construction of language skills
___f) facilitating communication with others (peers, experts…)
___g) facilitating language learning in new environments (simulations, virtual classrooms...)
___h) facilitating cultural awareness
___i) facilitating learning across the curriculum
___j) facilitating authenticity in the learning situation
___k) paving the way for new tasks and exams
___l) other roles, which? _____

_____

Section 4. Teachers: roles, qualifications etc.

Base the following on your experience with and knowledge of ICT in learning and teaching English.

16. On the scale from "not important" to "decisive", underline which teacher role/qualification you think is more or less important for a teacher in an ICT-rich environment:

a) to be an instructor
not important a minor role a major role decisive

b) to be a facilitator
not important a minor role a major role decisive

c) to be a catalyst for pupils' ideas
not important a minor role a major role decisive

d) to be a designer of learning situations
not important a minor role a major role decisive

e) to be a skilled navigator on the Internet
not important a minor role a major role decisive

f) to be able to evaluate Internet sources
not important a minor role a major role decisive

g) to be an interpreter of resources in virtual space
not important a minor role a major role decisive

h) to be technically proficient
not important a minor role a major role decisive

i) to be knowledgeable about software
not important a minor role a major role decisive

j) to be highly skilled in English as a foreign language
not important a minor role a major role decisive

k) to be highly skilled in didactics and pedagogy
not important a minor role a major role decisive

l) to be inventive
not important a minor role a major role decisive

m) to be a researcher on one's own practice in the classroom
not important a minor role a major role decisive

17. The following scale shows a continuum from **1** to **8** where **1 is a traditional learning environment (classroom) and 8 is a virtual learning environment** (classroom on the net, virtual conference centre, WWW-presentations, email exchange...). Middle values suggest combinations of the two.

Where do you see yourself as a teacher in an ICT environment? Circle the value you feel correspond to your place in an ICT-enhanced learning environment.

Traditional **Virtual**

1 2 3 4 5 6 7 8

18. Underline the value to say whether you "fully agree", "partly agree", "partly disagree" or "fully disagree" to the following statements.

As a teacher of English in an ICT learning environment,

a) I believe I am more useful than ever
fully agree partly agree partly disagree fully disagree

b) I believe it demands more of me as a professional expert on language learning
fully agree partly agree partly disagree fully disagree

c) I believe I have valuable professional qualities to offer
fully agree partly agree partly disagree fully disagree

d) I believe I have expertise that is needed
fully agree partly agree partly disagree fully disagree

e) I feel my identity as a teacher grows stronger
fully agree partly agree partly disagree fully disagree

f) I feel my identity as a teacher is taken away
fully agree partly agree partly disagree fully disagree

g) I feel marginalised
fully agree partly agree partly disagree fully disagree

h) I feel insecure
fully agree partly agree partly disagree fully disagree

i) I feel lost
fully agree partly agree partly disagree fully disagree

j) I feel I am working in between two incompatible environments (physical and virtual)
fully agree partly agree partly disagree fully disagree

k) I feel I am working in between two complementary environments (physical and virtual)

fully agree partly agree partly disagree fully disagree

l) I do not believe in the distinction between physical and virtual environments

fully agree partly agree partly disagree fully disagree

19. I believe learning a foreign language to be the result of (just tick one):

___a) The pupil acquiring the structures of the foreign language
___b) Meaningful input that triggers language learning capacities in the pupils' mind
___c) The pupil participating in social interaction

Section 5: Open ended questions **(feel free to write in Norwegian, use additional sheets if necessary.)**

20) The most *important* thing(s) I learned from this course is/are:

_____
_____
_____
_____

21) The most *unexpected* insight for me has proved to be:

_____
_____
_____
_____

22) The biggest *change* for a teacher going from a "traditional" to an ICT-rich learning environment in EFL is:

_____
_____
_____
_____

23) In EFL, the *advantages* of an ICT learning environment are:

_____
_____
_____
_____

24) Regarding ICT, I think *pre-service teacher training* for future teachers of English should focus on:

_____
_____
_____
_____

25) Regarding ICT, I think *in-service training* for practicing teachers of English should focus on:

_____
_____
_____
_____

26) Additional comments

_____
_____
_____
_____

Thank you for your time and support!

APPENDIX 2: a note on transcription symbols

Material becomes data through selection (what is included or excluded) and transcription (level of detail, a *version* of what took place). In both processes, the researcher is highly present and instrumental in what ultimately reaches the reader. For instance, what is selected as transcribed data in the present study are sequences that accrue characteristics of the 'episodic' unit of analysis (see Chapter 4.7). Moreover, some contextual material has been supplied in order to bring in cultural-historical dimensions. As for the level of detail, only a few transcription symbols have been used. One reason is found in the phenomenon under examination; it consists of classroom interaction on multiple levels and not purely linguistic or micro-level elements. Another reason is found in what Stephanie Taylor refers to as an 'epistemological argument'; that "extremely detailed transcript may suggest that the analysis is derived directly from the data, downplaying the role of the analyst, as in the positivist and postpositivist tradition", and "that the analyst is a detached and objective technician rather than the involved interpreter (…)" (Taylor, 2001b:36).

For the present study, transcription was carried out as an iterative, cyclical process in which sequences and episodes that were interpreted as 'significant' – i.e. carrying importance for the unfolding of the educational practices – were transcribed according to the system devised by Gail Jefferson (Wooffitt, 2001:62) and since adopted by researchers in many fields. The system is not exploited in detail, and the use of singular parentheses is somewhat extended in the present study. An overview of the symbols used is listed below.

(*unintelligible*)	Indicates the presence of an unclear fragment on the tape
(( ))	A description enclosed by a double parenthesis indicates a non-verbal activity, e.g. ((*stops and checks*)) or ((*pause*)). Descriptive elements and researcher's comments are also rendered in *italics* within double parentheses
<u>Emphasis</u>	Underlined elements indicate speaker emphasis
[ ]	Square brackets indicate where the end of and the onset of two consecutive elements overlap, alternatively two left hand brackets aligned vertically indicate the onset of two elements simultaneously
…	Indicates hesitation or short stop between elements in an utterance
(…)	Indicates that elements have been left out from a transcribed incident or episode

In addition, the teacher is identified by a T, an unidentified learner by an L, several unidentified learners are consecutively numbered L1, L2 etc. Unidentified learners speaking in unison are labeled Ls, identified learners are identified by (altered) first names. Where gender is identified, the L is followed by a singular parenthesis stating (boy) or (girl). The present researcher is identified by an R.

Postings in conferences are rendered as they appeared, including non-standard usage and mistakes. Translated utterances appear in italics, embraced by square brackets, e.g. *[translation]*.

APPENDIX 3: new style EFL term test with ICTs. Preparatory phase

L Æ R I N G S S E N T E R E T

Heldagsprøve i

Engelsk

VG1201

IT-forsøk

Uke 16 og 17- 2001

Felles allmenne fag

Grunnkurs 5 timer

Les opplysningene på side 2

FORBEREDELSE

Bokmål

Tema for forberedelsesdelen: Den amerikanske ideen om individuell frihet

Forberedelsesdel: Engelsktimene i uke 16 og 17-2001

Hjelpemidler: I *forberedelsesdelen* er alle hjelpemidler tillatt. I engelsktimene og ellers i skolens ordinære åpningstid har du tilgang til personlig datamaskin med nettverkstilkobling.

Under selve *heldagsprøven* er også alle hjelpemidler tillatt, utenom å kommunisere med andre.

Informasjon du skaffer deg i *forberedelsesdelen*, vil være til nytte under *heldagsprøven.*

Å innhente relevante opplysninger for siden å dra nytte av dem på en klok måte i ditt eget produkt, er en viktig del av den kompetansen som læreplanen skildrer.

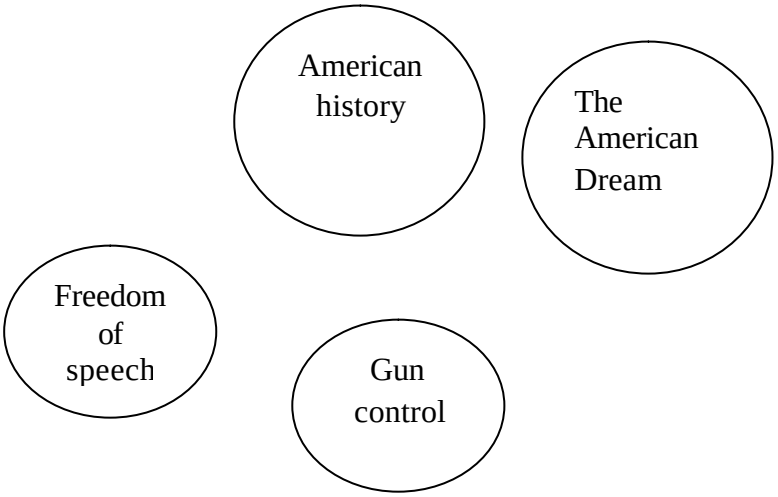
Antall sider: 3 sider medregnet forsiden

Preparation

The American idea of individual freedom

In your English lessons, the following two weeks, you are supposed to work with the American idea of individual freedom. The information and knowledge you gather will be useful on the day of the term test.

Do research into some aspects of the American society, for example:



You may find useful links on the Internet site:

http://home.online.no/~ingskifj/english_links/

This site will also give you the opportunity to communicate with other students who are taking the same test. You can share information and links. Make sure that you check the message board regularly to see if there are any new postings.

APPENDIX 4: new style EFL term test with ICTs. Production phase

HELDAGSPRØVE

L Æ R I N G S S E N T E R E T

Engelsk

VG1201

IT-forsøk

27. april 2001

Felles allmenne fag
Grunnkurs 5 timer

Les opplysningene på side 2

Prøvens varighet:	5 timer
Hjelpemidler:	Alle hjelpemidler er tillatt, unntatt Internett og andre former for kommunikasjon med andre.
Antall sider:	3 tekstsider medregnet forsiden
Generelt om vurdering:	Det er helhetsinntrykket av svaret ditt som blir vurdert. Sensor skal honorere god bruk av kunnskaper om emnet, god tekstbinding og presist og variert språk. Dessuten skal sensor honorere svar som er oppfinnsomme, og som viser evne til å utnytte mulighetene i språket.

Term test 27. April 2001

You have been working with the American idea of freedom. Now use the information you have gathered when doing the following task.

Read the excerpt from President Bush' inaugural speech below. Choose one aspect of American society and discuss whether what he says about freedom is true or not.

Vurderingsveiledning til elever og sensor:

Når sensor vurderer svaret ditt, vil han eller hun se etter at du underbygger påstandene dine og at du bruker gode eksempler. Du blir honorert for å gå i dybden. Uttrykk deg klart og presist.

Se også den generelle vurderingsveiledningen på side 2

Good luck!

January 20, 2001 :

President Clinton, distinguished guests and my fellow citizens:

The peaceful transfer of authority is rare in history, yet common in our country. With a simple oath, we affirm old traditions and make new beginnings.

As I begin, I thank President Clinton for his service to our nation; and I thank Vice President Gore for a contest conducted with spirit and ended with grace. I am honored and humbled to stand here, where so many of America's leaders have come before me, and so many will follow.

We have a place, all of us, in a long story. A story we continue, but whose end we will not see. It is the story of a new world that became a friend and liberator of the old, a story of a slave-holding society that became a servant of freedom, the story of a power that went into the world to protect but not possess, to defend but not to conquer. It is the American story. A story of flawed and fallible people, united across the generations by grand and enduring ideals. The grandest of these ideals is an unfolding American promise that everyone belongs, that everyone deserves a chance, that no insignificant person was ever born. Americans are called upon to enact this promise in our lives and in our laws; and though our nation has sometimes halted, and sometimes delayed, we must follow no other course.

Through much of the last century, America's faith in freedom and democracy was a rock in a raging sea. Now it is a seed upon the wind, taking root in many nations. Our democratic faith is more than the creed of our country, it is the inborn hope of our humanity, an ideal we carry but do not own, a trust we bear and pass along; and even after nearly 225 years, we have a long way yet to travel.
(…)

America, at its best, is a place where personal responsibility is valued and expected. Encouraging responsibility is not a search for scapegoats, it is a call to conscience. Though it requires sacrifice, it brings a deeper fulfillment. We find the fullness of life not only in options, but in commitments. We find that children and community are the commitments that set us free. Our public interest depends on private character, on civic duty and family bonds and basic fairness, on uncounted, unhonored acts of decency which give direction to our freedom. Sometimes in life we are called to do great things. But as a saint of our times has said, every day we are called to do small things with great love. The most important tasks of a democracy are done by everyone. I will live and lead by these principles, "to advance my convictions with civility, to pursue the public interest with courage, to speak for greater justice and compassion, to call for responsibility and try to live it as well." In all of these ways, I will bring the values of our history to the care of our times.

What you do is as important as anything government does. I ask you to seek a common good beyond your comfort; to defend needed reforms against easy attacks; to serve your nation, beginning with your neighbor. I ask you to be citizens. Citizens, not spectators; citizens, not subjects; responsible citizens, building communities of service and a nation of character.

Americans are generous and strong and decent, not because we believe in ourselves, but because we hold beliefs beyond ourselves. When this spirit of citizenship is missing, no government program can replace it. When this spirit is present, no wrong can stand against it. After the Declaration of Independence was signed, Virginia statesman John Page wrote to Thomas Jefferson, "We know the race is not to the swift nor the battle to the strong. Do you not think an angel rides in the whirlwind and directs this storm?" Much time has passed since Jefferson arrived for his inauguration. The years and changes accumulate, but the themes of this day he would know, "our nation's grand story of courage and its simple dream of dignity." We are not this story's author, who fills time and eternity with His purpose. Yet His purpose is achieved in our duty, and our duty is fulfilled in service to one another. Never tiring, never yielding, never finishing, we renew that purpose today; to make our country more just and generous; to affirm the dignity of our lives and every life.

This work continues. This story goes on. And an angel still rides in the whirlwind and directs this storm.

God bless you all, and God bless America.

- George W. Bush, 2001

APPENDIX 5: PowerPoint slide from presentation at Minerva

Where to go, and what to do

- Mecca for extreme sport.
- Series of festivals.
- Many attractions.
- Wellington
- Auckland
- Northland
- National parks.

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Index